PB83-253419

Final Environmental Impact Statement
Hilton Head, South Carolina
Wastewater Facilities

(U.S.) Environmental Protection Agency
Atlanta, GA. Region IV

Aug 83

U.S. Department of Commerce
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15. Supplementary Notes

Environmental impact statement

16. Abstracts

This Final EIS addresses proposed wastewater facilities for Hilton Head Island, South Carolina. Numerous wastewater management alternatives have been evaluated with particular attention to water quality in the area's surface and groundwater resources and the impacts of projected population growth on the natural and human resources of Hilton Head Island and the surrounding area.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

AUG 26 1983

TO ALL INTERESTED AGENCIES, PUBLIC GROUPS, AND CITIZENS:

Enclosed for your review and comment is the Final Environmental Impact Statement (EIS) for wastewater management in Hilton Head Island, South Carolina.

This EIS was prepared in compliance with the National Environmental Policy Act and implementing Agency regulations (40 CFR Part 6, November 6, 1979). In accordance with these regulations, the Final EIS will be filed with EPA's Office of Federal Activities. Availability of the EIS will then be announced in the Federal Register, beginning a 30-day comment period. (The Federal Register date is the same as the date of this notice). This Agency will take no administrative action on this project until the close of the comment period.

We will appreciate your review of this document and any comments you may have. Please send all comments to:

Mr. Robert Cooper, Project Officer
NEPA Compliance Section
Environmental Assessment Branch
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

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PB83-253419

United States
Environmental Protection
Agency

Region 4
345 Courtland Street, NE
Atlanta, GA 30365

EPA 904/9-83-115
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EPA

Environmental Impact Statement

Final

Hilton Head, South Carolina Wastewater Facilities

REPRODUCED BY
NATIONAL TECHNICAL
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U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

FINAL
ENVIRONMENTAL IMPACT STATEMENT
for
HILTON HEAD ISLAND, SOUTH CAROLINA
Prepared by
U.S. Environmental Protection Agency
Region IV
Atlanta, Georgia 30365

This Final EIS addresses proposed wastewater facilities for Hilton Head Island, South Carolina. Numerous wastewater management alternatives have been evaluated with particular attention to water quality in the area's surface and groundwater resources and the impacts of projected population growth on the natural and human resources of Hilton Head Island and the surrounding area.

Comments and inquiries should be forwarded to:

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Approved by

Charles R. Jeter
Regional Administrator

August 10, 1983
Date

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY FOR ENVIRONMENTAL IMPACT STATEMENT

HILTON HEAD ISLAND WASTEWATER FACILITIES

Draft ( )
Final (x)

Environmental Protection Agency
Region IV
345 Courtland Street
Atlanta, Georgia 30365

Type of Action:
Administrative Action (x)
Legislative Action ( )

EXECUTIVE SUMMARY

PART A. PURPOSE OF EIS AND BACKGROUND

This Environmental Impact Statement (EIS) addresses alternatives for and impacts of the provision of wastewater management facilities on Hilton Head Island. Wastewater collection and treatment on Hilton Head is principally provided by designated public services districts, which have been established by state enabling legislation. Four public service districts comprise the island as follows:

- Sea Pines Public Service District
- Forest Beach Public Service District
- Broad Creek Public Service District
- Hilton Head No. 1 Public Service District

Each public service district (PSD) operates its own wastewater treatment and disposal facilities, with the exception of the Forest Beach Public Service District. Wastewater is conveyed from Forest Beach to the Sea Pines Public Service District for treatment and disposal. Plate ES-1 depicts the location of the PSD treatment facilities and spray irrigation areas.

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Hilton Head Plantation is served by treatment facilities owned and operated by the Hilton Head Plantation Utilities Corporation. Several small, privately-owned treatment facilities are located elsewhere on the island which provide service to isolated residential or resort areas including the Long Cove Club, Wexford, Cotton Hope Plantation, Jenkins Island - Windmill Harbour and the Mariners Cove Club. The remaining rural areas of the island utilize septic tank-drainfield systems.

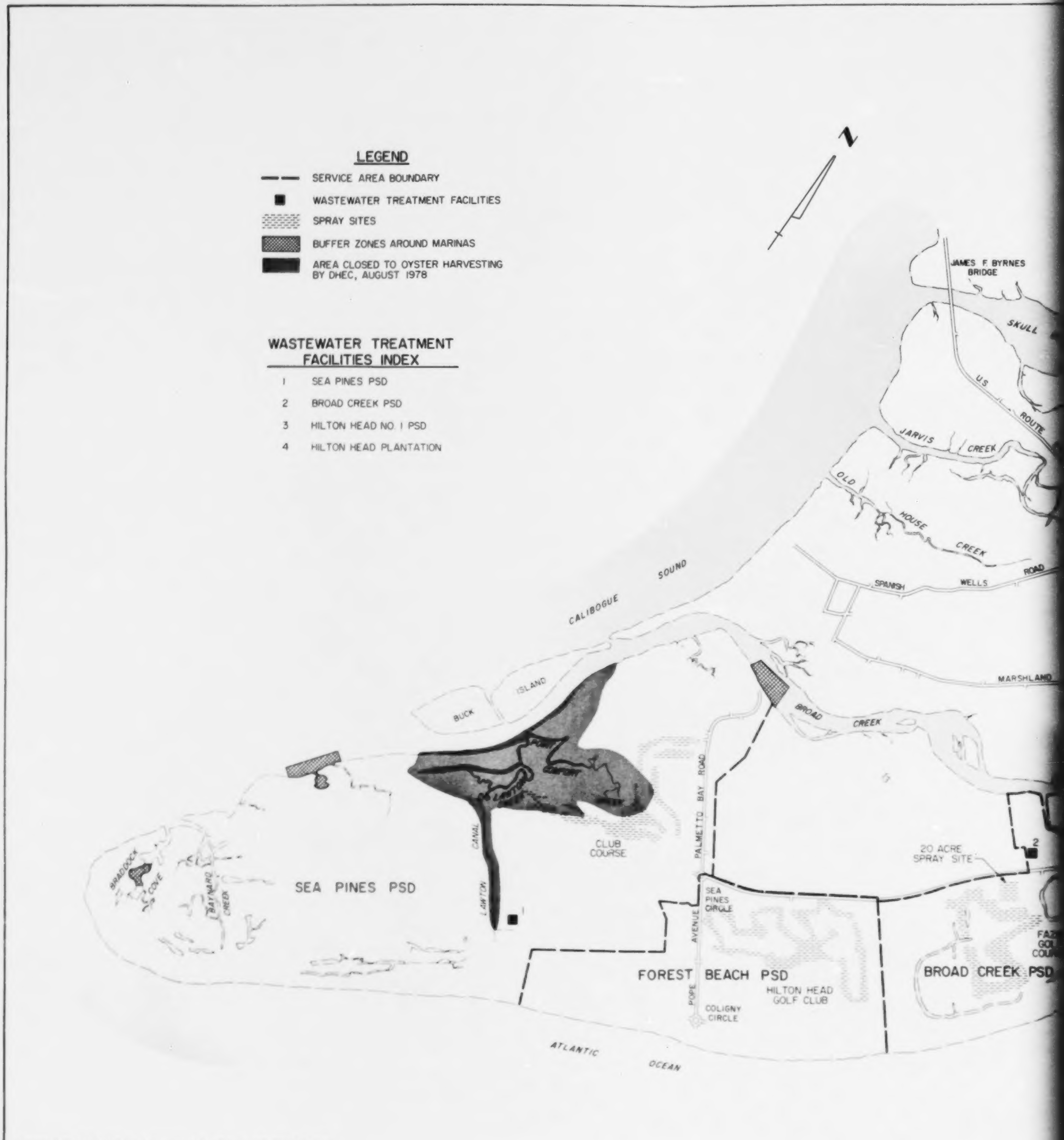
Treated wastewater from the wastewater facilities on the island is disposed of by several methods. To a large extent, treated wastewater is used to irrigate the golf courses on the island. In a few cases, treated wastewater is sprayed onto areas of open land as a supplement to golf course irrigation. However, present wastewater flows from the Sea Pines PSD - Forest Beach PSD exceed the total irrigation demands of the golf courses located within Sea Pines and Shipyard Plantations. As a result, up to 1.8 million gallons per day (mgd) of treated wastewater are discharged into Lawton Canal and thence to Lawton Creek which is classified for shellfishing.

The 201 Facilities Plan, completed in 1975, recommended that the effluent from all treatment plants be disposed of by spray irrigation on nearby golf courses so as not to impact area shellfish waters. While conceptually sound, this scheme was based upon golf course irrigation rates which have proved to be optimistic, particularly in the case of the Sea Pines PSD and the Forest Beach PSD. The continued ability of the other PSD's on the island to dispose of their treated wastewater by golf course irrigation will depend upon the actual rate of development experienced within each.

In August 1978 the South Carolina Department of Health and Environmental Control (DHEC) closed shellfish beds in Lawton Canal and Lawton Creek, in Point Comfort Creek, and in adjacent waters of Broad Creek. These areas were closed because of high total and fecal coliform counts encountered in surface water samples. Subsequent water quality studies confirmed that shellfish standards were being violated; findings indicated that these violations were attributable to non-point source bacterial contamination.

Because of these environmental complexities and the uniqueness of Hilton Head as a barrier island, the Environmental Protection Agency decided to prepare an Environmental Impact Statement with respect to wastewater management facilities to serve the existing and future populations of Hilton Head Island. Subsequently, a Notice of Intent was issued by the EPA Regional Administrator in April, 1979. Concurrent with the Hilton Head EIS, the South Carolina DHEC initiated a study of the Lawton Creek - Broad Creek watershed in order to better define the extent to which non-point and point sources influence their bacterial characteristics. These studies confirmed the existence and magnitude of non-point contamination of Lawton Creek. Only the effluent from the Sea Pines treatment plant met water quality standards with any consistency.

Additional non-point work has been performed through the 208 program under the direction of an advisory committee representing local, state, and Federal governments. The study has recommended effective management practices to abate non-point pollution from island development. These recommendations are now before the Beaufort County Council.


LEGEND
SERVICE AREA BOUNDARY
WASTEWATER TREATMENT FACILITIES
SPRAY SITES
BUFFER ZONES AROUND MARINAS
AREA CLOSED TO OYSTER HARVESTING BY DHEC, AUGUST 1978
WASTEWATER TREATMENT FACILITIES INDEX
1 SEA PINES PSD
2 BROAD CREEK PSD
3 HILTON HEAD NO. 1 PSD
4 HILTON HEAD PLANTATION
N
JAMES F. BYRNES BRIDGE
SKULL
US ROUTE
JARVIS CREEK
OLD HOUSE CREEK
SPANISH WELLS ROAD
CALIBOGUE SOUND
MARSHLAND
BUCK ISLAND
BROAD CREEK
PALMETTO BAY ROAD
CLUB COURSE
LAWTON CANAL
1
2
20 ACRE SPRAY SITE
BRADDOCK COVE
BAYNARD CREEK
SEA PINES PSD
SEA PINES CIRCLE
POPE AVENUE
FOREST BEACH PSD
HILTON HEAD GOLF CLUB
COLIGNY CIRCLE
BROAD CREEK PSD
FAZ GOL COU
ATLANTIC OCEAN

SOURCE: 1. SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL, BUREAU OF SPECIAL ENVIRONMENTAL PROGRAMS, SHELLFISH SECTION.

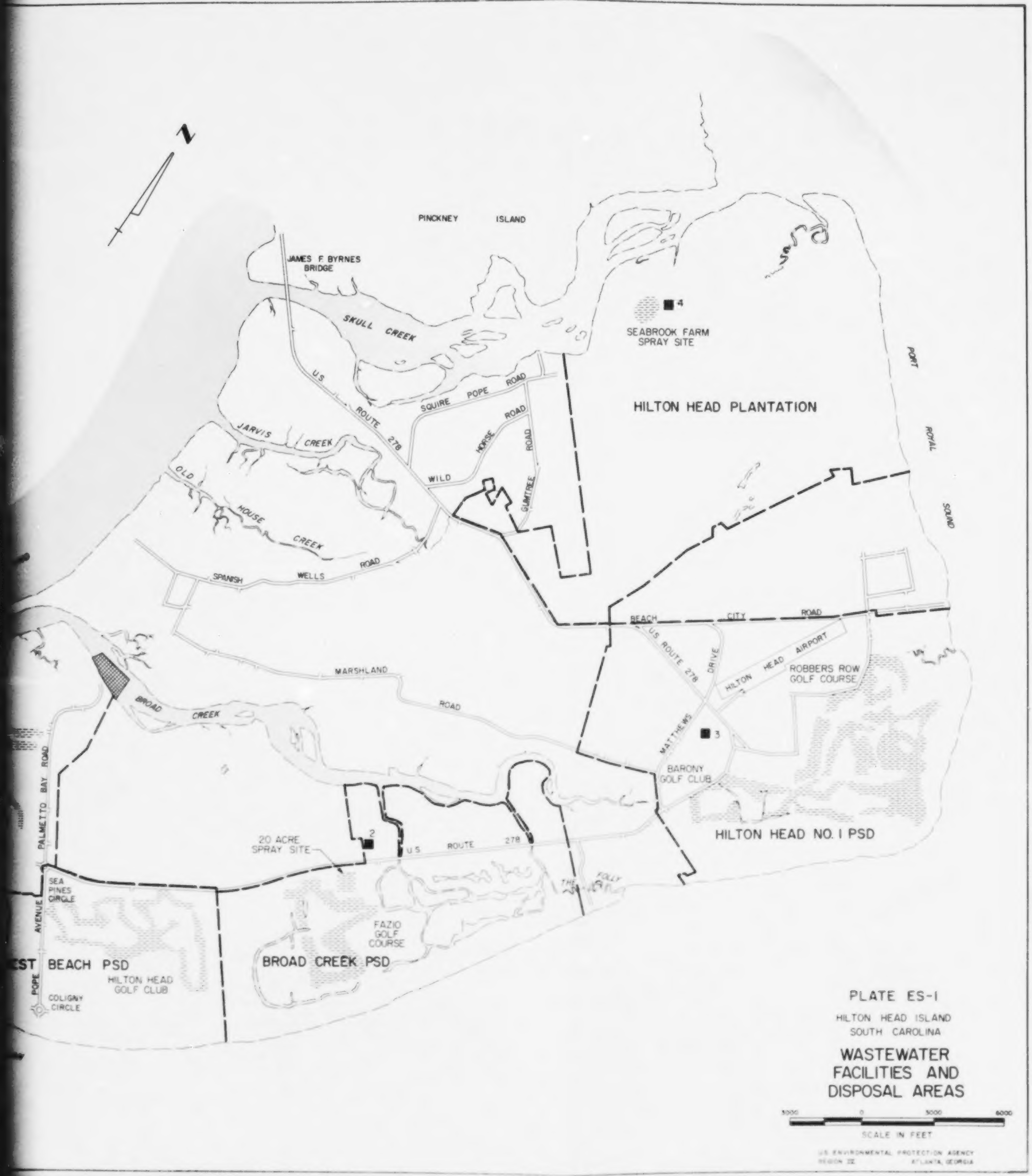

N
PINCKNEY ISLAND
JAMES F. BYRNES BRIDGE
SKULL CREEK
4
SEABROOK FARM SPRAY SITE
PORT ROYAL SOUND
HILTON HEAD PLANTATION
US ROUTE 278
SQUIRE POPE ROAD
WILD HORSE ROAD
GUMTREE ROAD
JARVIS CREEK
OLD HOUSE CREEK
SPANISH WELLS ROAD
BEACH CITY ROAD
US ROUTE 278
DRIVE
HILTON HEAD AIRPORT
ROBBERS ROW GOLF COURSE
MARSHLAND ROAD
BROAD CREEK
MATTHEWS
3
BARONY GOLF CLUB
PALMETTO BAY ROAD
20 ACRE SPRAY SITE
2
U.S. ROUTE 278
HILTON HEAD NO. I PSD
THE FOLLY
SEA PINES CIRCLE
POPE AVENUE
FAZIO GOLF COURSE
EST BEACH PSD
BROAD CREEK PSD
HILTON HEAD GOLF CLUB
COLIGNY CIRCLE
3000 0 3000 6000
SCALE IN FEET

PLATE ES-1

HILTON HEAD ISLAND
SOUTH CAROLINA

WASTEWATER
FACILITIES AND
DISPOSAL AREAS

US ENVIRONMENTAL PROTECTION AGENCY
REGION IV ATLANTA, GEORGIA

PART B. CHANGES AND NEW INFORMATION SINCE THE DRAFT

Comments regarding the Draft EIS were received at the June 23, 1982 public hearing held at the Hilton Head Island Elementary School and during the comment period held afterward. These comments and new information have been carefully considered in the Final EIS process.

New information incorporated into the Final EIS includes:

a. The alternative wastewater management program proposed by the Sea Pines Public Service District has been thoroughly evaluated and serves as the basis of EPA's final decision.

b. Comments regarding the population projections for Hilton Head Island and the associated wastewater flows have been considered. Updated flow projections have been made for the major service areas and wastewater management alternatives re-evaluated.

c. Several commenters indicated the need for a wastewater management plan for the entire island, regardless of EPA's funding and permitting constraints. Although the EIS focuses on the Sea Pines PSD - Forest Beach PSD, EPA recognizes and supports comprehensive wastewater management alternatives for the remainder of Hilton Head. Several alternatives are presented in the Final EIS, and recommendations made with respect to local implementation of an island-wide plan.

d. Several persons and interests commented regarding non-point source pollution on Hilton Head Island; all were concerned with the water quality impacts resulting from non-point source pollution. Some commenters supported EPA's action to condition funding for additional wastewater facilities upon demonstrated progress toward solving the non-point source problem. While others concurred with the EPA conclusion regarding the magnitude of non-point source pollution, these commenters believed the Draft EIS to be lacking because it did not offer any specific solutions. EPA's final decision addresses these concerns.

e. The South Carolina Coastal Council has adopted a Special Area Management Plan for Hilton Head Island which establishes policy with respect to new projects or the expansion and significant alteration of existing projects or activities. Among other things, policy is set forth regarding the discharge of treated sewage into the surface waters of Hilton Head Island. The final evaluation of wastewater management alternatives is consistent with Council policy.

f. The Cubit Engineering dye study performed for the Sea Pines Public Service District evaluates water quality impacts from a wastewater discharge into Calibogue Sound. This information has been considered by EPA during the decision process.

g. Residents of Hilton Head have recently voted by referendum to attain city-status through incorporation. Consequently, many of the actions recommended to be taken at the local government level as mitigative measures, particularly with respect to land use and non-point source control, will become the eventual responsibility of the new City of Hilton Head Island.

PART C. ALTERNATIVES CONSIDERED AND THEIR EVALUATION

A broad range of wastewater management alternatives were formulated and evaluated for the Sea Pines PSD - Forest Beach PSD and the remainder of the island. The alternatives presented in the Final EIS are based upon updated wastewater flows for the major service areas as noted below.

Service Area	Peak Wastewater Flow
Sea Pines PSD - Forest Beach PSD	4.5 mgd
Broad Creek Public Service District	2.4 mgd
Hilton Head No. 1 PSD	2.8 mgd
Gardner-Matthews Plantation	1.1 mgd
Hilton Head Plantation	2.0 mgd

During the alternative evaluation process, reuse of treated wastewater for beneficial purposes through golf course, open space, and lawn irrigation was considered to be a primary objective. However, it is recognized that, during periods of heavy rainfall, irrigation needs may be insufficient to utilize all of the treated wastewater on the island. Consequently, a supplemental backup system is required for each reuse system. Supplemental disposal techniques include discharge to Lawton Canal, discharge to either Calibogue Sound or the Atlantic Ocean via a subaqueous outfall and diffuser, and treatment and land application either on or off the island.

Alternative management schemes are generally described below.

Sea Pines PSD - Forest Beach PSD

Each wastewater management system for the Sea Pines - Forest Beach service area includes expansion of the Sea Pines PSD treatment plant to 5.0 mgd; irrigation of the five 18-hole and one 9-hole golf courses within the service area; and possible implementation of the experimental wetlands discharge in the Sea Pines Forest Preserve. Seven different alternatives have been formulated around these common elements as summarized below.

Lawton Canal Discharge - This alternative involves the discharge of advanced-treated wastewater to Lawton Canal as a supplement to irrigation of the golf courses. Sand filters would be constructed at the 5.0 mgd plant proposed by the Sea Pines PSD in order to achieve the effluent quality required by DHEC. The experimental wetlands discharge system could be utilized to the extent possible.

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Calibogue Sound Discharge - This alternative involves the discharge of secondary-treated wastewater to Calibogue Sound through a subaqueous outfall and diffuser as a supplement to irrigation of the golf courses. Again, the experimental wetlands discharge system could be utilized to the extent possible.

Atlantic Ocean Discharge - This alternative involves the discharge of secondary-treated wastewater to the Atlantic Ocean through subaqueous outfall and diffuser as a supplement to irrigation of the golf courses. Again, the experimental wetlands discharge system could be utilized to the extent possible.

A substantially longer underwater outfall is required to reach a 20-foot depth in the Atlantic Ocean than required to reach water of greater than 30-foot depth in Calibogue Sound. Figure ES-1 shows relative water depths in the Sound and in the Ocean.

Wastewater Reuse - Treated wastewater will be reused not only to irrigate golf courses but also to irrigate open space and lawns. Wastewater will be treated to an advanced level to achieve a suspended solids concentration of 5 mg/l prior to reuse. The experimental wetlands discharge system may continue to be implemented in an effort to reestablish diminishing wetlands within the Forest Preserve.

A backup system must be constructed for periods of heavy rainfall. This system can be a discharge to Calibogue Sound, an Ocean outfall, or any other approved system that will meet Federal, State, and local requirements.

Rapid Infiltration - This alternative has been developed to meet the possible constraint that lands outside of the PSD boundaries could not be obtained for the land application of wastewater to supplement golf course irrigation. A combination of rapid infiltration, woodlands irrigation, and wetlands discharge into the Forest Preserve is required to provide this supplemental capacity.

The woodlands irrigation scheme involves the application of treated wastewater onto wooded parcels which lie within the Forest Beach PSD along its boundary with the Broad Creek PSD and immediately adjacent to the Hilton Head Golf Club. These parcels have an estimated usable area of approximately 32 acres. At an application rate of 2 inches per week, approximately 0.25 mgd could be applied.

As indicated in a previous report prepared for the Sea Pines PSD, a site within the Sea Pines Forest Preserve adjacent to the Sea Pines PSD plant is the best site available for construction of a rapid infiltration system. This area is presently wooded and construction of a rapid infiltration system would require extensive clearing and site alteration. Approximately 80 acres of bed area would be required to dispose of 3.25 mgd.

Assuming that the woodlands irrigation and rapid infiltration components can handle 0.25 mgd and 3.25 mgd respectively, the wetlands discharge system must handle 1.0 mgd to provide a workable alternative. If either wetlands discharge or rapid infiltration cannot reliably handle the indicated rate of application, then the other must accommodate the difference. If both wetlands discharge and rapid infiltration cannot reliably handle their respective rates of application, there is insufficient suitable land within the PSD's for woodlands irrigation to take up the slack.

Spray Irrigation On-Island - This alternative provides for the disposal of wastewater quantities which are not used by the golf courses totally by spray irrigation on a single large tract outside the boundaries of the PSD's. The experimental wetlands discharge system could be utilized to the extent possible.

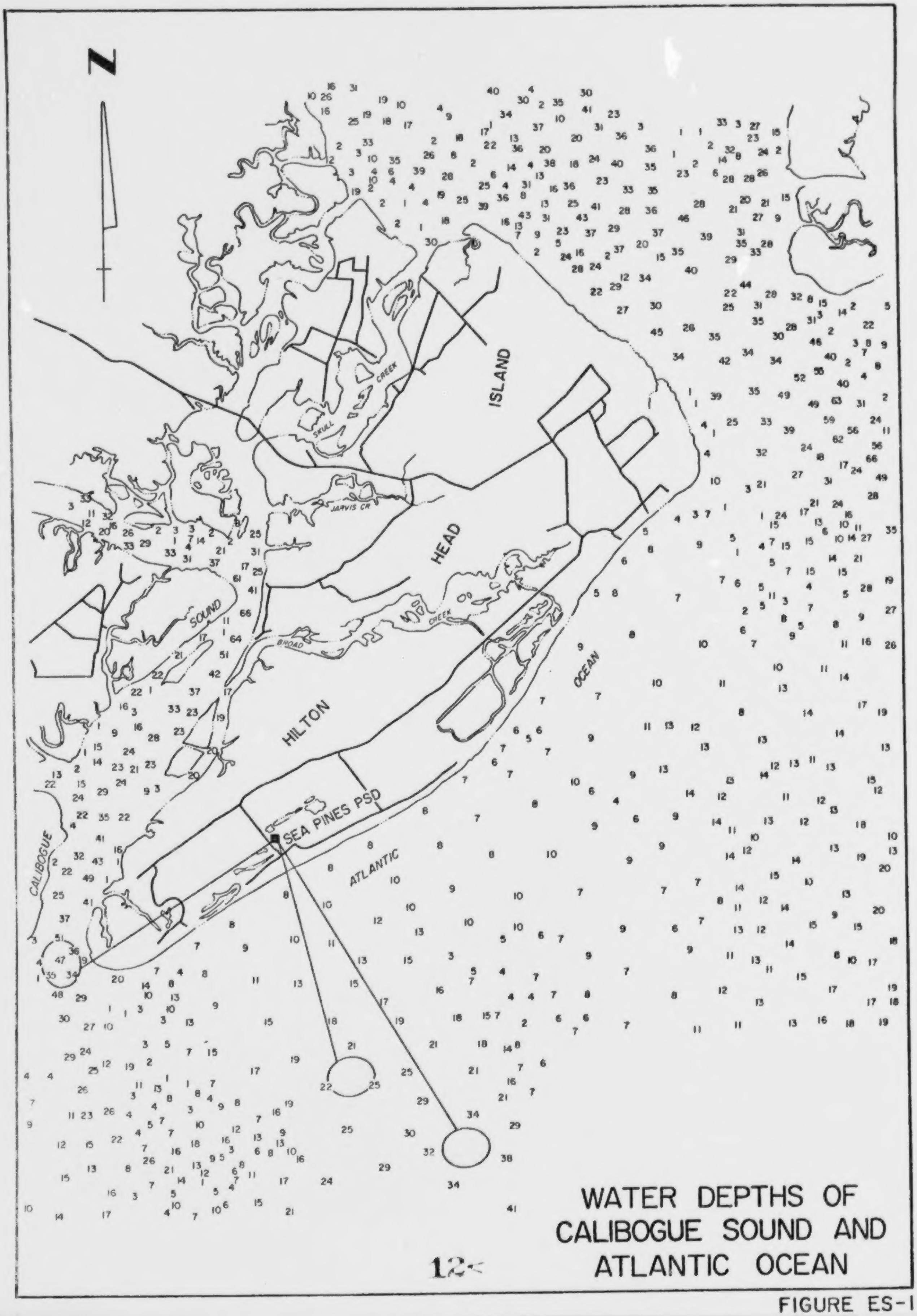
Of the undeveloped land parcels on Hilton Head, the Gardner-Matthews tract (Parcel 1 on Beaufort County Tax Map 11) has been identified as most suitable for land application of treated wastewater. This parcel has a total area of nearly 1,000 acres; almost 40 percent of the parcel is composed of the well-drained Wando soils which are generally located in the center of the parcel. The Otter Hole Trailer Park and a 15-acre residential property lie within the tract. Almost all of the estimated 600 usable acres would be required for the land application system.

Spray Irrigation Off-Island - This alternative provides for the disposal of wastewater quantities which are not used by the golf courses totally by spray irrigation on large tracts of land off the island including the crossing of Skull Creek and Mackay Creek either with an underwater pipeline or pipe suspended from the bridges. Again, the experimental wetlands discharge system could be utilized to the extent possible.

Three general areas on the mainland have been identified as potential spray sites, based upon soils characteristics. These areas are Union Camp property in the Bluffton area, contiguous parcels in the Sawmill Creek area, and contiguous parcels south of Route 278 generally across from Moss Creek Plantation.

No-Federal Action Alternative - A requirement of the EIS process developed by EPA is that a no-action alternative will be considered along with other wastewater facilities alternatives. The no-action alternative implies that no Federal funding would be available for wastewater facilities on Hilton Head. Under this alternative, improvement and/or expansion of the wastewater facilities would be required but there would be no Federal funds provided for design and construction of the facilities.

The wastewater management alternatives formulated for the Sea Pines PSD - Forest Beach PSD were evaluated with respect to several factors including costs, environmental impacts, and implementability. Table ES-1 summarizes the evaluation of the Sea Pines - Forest Beach alternatives previously described.


N
ISLAND
SKULL CREEK
JARVIS CR
HEAD
SOUND
BROAD CREEK
HILTON
OCEAN
SEA PINES PSD
ATLANTIC
CALIBOGUE

WATER DEPTHS OF CALIBOGUE SOUND AND ATLANTIC OCEAN

FIGURE ES-1

TABLE ES-1

SEA PINES PSD - FOREST BEACH PSD
SUMMARY OF ALTERNATIVES EVALUATION

Alternative	Cost (Total Present Worth)	Environmental Impacts	Implementability
Discharge to Lawton Canal with Sand Filters	$1,659,400	1. Increase in size of areas closed to shellfishing will be required due to increased wastewater flows into SA waters.	1. NPDES permit required from DHEC.
		2. Selection of this alternative could set a precedent for the approval of other discharges into SA waters.	2. New buffer zone boundary for discharge to shellfish waters must be established.
		3. Selection of this alternative would provide Federal support for population growth potentially causing increased urban runoff into SA waters.	3. Permit required from Coastal Council.

TABLE ES-1

SEA PINES PSD - FOREST BEACH PSD
SUMMARY OF ALTERNATIVES EVALUATION

Alternative	Cost (Total Present Worth)	Environmental Impacts	Implementability
Discharge to Calibogue Sound without Sand Filters	$2,696,600	1. The discharge of treated wastewater into the SA waters of Lawton Canal and Broad Creek would be eliminated; however, shellfish closures would remain unless existing non-point source problems are abated.	1. NPDES Permit required from DHEC.
		2. Selection of this alternative would allow a continuous discharge into Calibogue Sound.	2. Permit required from Coastal Council; discharge of secondarily treated effluent is not consistent with the Hilton Head Island Special Area Management Plan.
		3. Selection of this alternative would set a precedent for the approval of other discharges into coastal waters.	3. Department of the Army permit will be required for the construction of a subaqueous outfall and diffuser.
		4. Selection of this alternative would provide Federal support for population growth potentially causing increased urban runoff into SA waters.	4. Detailed studies needed to determine outfall pipe alignment, diffuser location and orientation, and port design.

TABLE ES-1

SEA PINES PSD - FOREST BEACH PSD
SUMMARY OF ALTERNATIVES EVALUATION

Alternative	Cost (Total Present Worth)	Environmental Impacts	Implementability
Discharge to Atlantic Ocean without Sand Filters	$4,451,800	1. The discharge of treated wastewater into the SA waters of Lawton Canal and Broad Creek would be eliminated; however shellfish closures would remain unless existing non-point source problems are abated.	1. NPDES Permit required from DHEC.
		2. Selection of this alternative would allow a continuous discharge into the Atlantic Ocean.	2. Permit required from Coastal Council; discharge of secondarily treated effluent is not consistent with the Hilton Head Island Special Area Management Plan.
		3. Selection of this alternative would set a precedent for the approval of other discharges into coastal waters.	3. Department of the Army permit will be required for the construction of a subaqueous outfall and diffuser.
		4. Selection of this alternative would provide Federal support for population growth potentially causing increased urban runoff into SA waters.	4. Detailed studies needed to determine outfall pipe alignment, diffuser location and orientation, and port design.

TABLE ES-1

SEA PINES PSD - FOREST BEACH PSD
SUMMARY OF ALTERNATIVES EVALUATION

Alternative	Cost (Total Present Worth)	Environmental Impacts	Implementability
Wastewater Reuse	$5,223,900 *	1. The discharge of treated wastewater into the SA waters of Lawton Canal and Broad Creek would be eliminated; however shellfish closures would remain unless existing non-point source problems are abated.	1. NPDES permit for back-up discharge to Calibogue Sound or the Ocean required from DHEC.
		2. Provides advanced treatment of wastewater to maximize reuse potential.	2. Permit required from Coastal Council for back-up discharge to Calibogue Sound or Ocean.
		3. Extends reuse of filtered wastewater to landscape areas, buffer areas, and residential lawn irrigation heretofore not approved for secondary treated effluent; increased reuse lessens demand on groundwater withdrawals from the Ocala Aquifer.	3. Department of the Army permit will be required for the construction of a subaqueous outfall and diffuser.
		4. Under this alternative, a back-up outfall to Calibogue Sound or the Ocean may be provided for periods of heavy rainfall.	4. Detailed studies needed to determine outfall pipe alignment, diffuser location and orientation, and port design for back-up Calibogue Sound or Ocean discharge.
		5. Selection of this alternative would set a precedent for similar management concepts elsewhere on the island.	
		6. Selection of this alternative would provide Federal support for population growth, potentially causing increased urban runoff into SA waters.	

* Cost includes Calibogue Sound outfall as backup system. Use of another backup system will modify that portion of costs.

TABLE ES-1

SEA PINES PSD - FOREST BEACH PSD
SUMMARY OF ALTERNATIVES EVALUATION

Alternative	Cost (Total Present Worth)	Environmental Impacts	Implementability
Rapid Infiltration	$9,232,700	1. The discharge of treated wastewater into the SA waters of Lawton Canal and Broad Creek could be eliminated; however shellfish closures would remain unless existing non-point source problems are abated. 2. This system is not technically feasible due to soil and water table conditions. 3. Rapid Infiltration system increases potential for groundwater contamination. 4. Rapid Infiltration system would require extensive clearing and site alteration of more than 100 acres within the Sea Pines Forest Preserve. 5. Spray irrigation within Shipyard Plantation would utilize 67 acres of otherwise developable land. 6. Selection of this alternative would provide Federal support for population growth potentially causing increased runoff into SA waters.	1. Sea Pines PSD must exercise power of eminent domain to acquire land. 2. Pilot testing of Rapid Infiltration system should precede full-scale implementation. 3. Extensive holding ponds or back-up discharge required for periods of heavy rainfall with attendant studies and permits.

TABLE ES-1

SEA PINES PSD - FOREST BEACH PSD
SUMMARY OF ALTERNATIVES EVALUATION

Alternative	Cost (Total Present Worth)	Environmental Impacts	Implementability
Land Application at Gardner-Matthews site.	$13,260,000	1. The discharge of treated wastewater into the SA waters of Lawton Canal and Broad Creek would be eliminated; however shellfish closures would remain unless existing non-point source problems are abated.	1. Beaufort County must exercise power of eminent domain to acquire land for PSD use. Development plans exist for current site.
		2. Construction of extensive spray irrigation network within the Gardner-Matthews site will alter existing habitat.	2. Site specific studies will be required to determine actual allowable application rate for spray irrigation system.
		3. This alternative would utilize over 600 acres of otherwise developable land.	3. Extensive holding ponds or back-up discharge required for periods of heavy rainfall with attendant studies and permits.
		4. Selection of this alternative would provide Federal support for population growth potentially causing increased runoff into SA waters.	

TABLE ES-1

SEA PINES PSD - FOREST BEACH PSD
SUMMARY OF ALTERNATIVES EVALUATION

Alternative	Cost (Total Present Worth)	Environmental Impacts	Implementability
Off-Island Land Application	$14,007,200	1. The discharge of treated wastewater into the SA waters of Lawton Canal and Broad Creek would be eliminated; however shellfish closures would remain unless existing non-point source problems are abated.	1. Beaufort County may be required to exercise power of eminent domain to acquire land for PSD use.
		2. Construction of extensive spray irrigation network at selected site will alter existing habitat.	2. Substantial opposition from Beaufort County residents regarding concept of off-island spray irrigation.
		3. Selection of this alternative would provide Federal support for population growth, potentially causing increased runoff into SA waters.	3. Department of Army (and Coastal Council) permit would be required if subaqueous crossing of Skull Creek and Mackay Creek utilized.
			4. Extensive holding ponds or backup discharge required for periods of heavy rainfall with attendant studies and permits.

TABLE ES-1

SEA PINES PSD - FOREST BEACH PSD
SUMMARY OF ALTERNATIVES EVALUATION

Alternatives	Cost (Total Present Worth)	Environmental Impacts	Implementability
No Federal Action. Sea Pines Public Service District would implement the Wastewater Reuse Alternative with 100% local funding.	$5,223,900 *	1. The discharge of treated wastewater into the SA waters of Lawton Canal and Broad Creek would be eliminated; however shellfish closures would remain unless existing non-point source problems are abated.	1. NPDES permit for back-up discharge to Calibogue Sound required from DHEC.
		2. Provides advanced treatment of wastewater to maximize reuse potential.	2. Permit required from Coastal Council for back-up discharge to Calibogue Sound.
		3. Extends reuse of filtered wastewater to landscape areas, buffer areas, and residential lawn irrigation heretofore not approved for secondary treated effluent; increased reuse lessens demand on groundwater withdrawals from the Ocala Aquifer.	3. Department of the Army permit will be required for the construction of a subaqueous outfall and diffuser.
		4. Under this alternative, a back-up outfall to Calibogue Sound or the Ocean may be provided for periods of heavy rainfall.	4. Detailed studies needed to determine outfall pipe alignment, diffuser location and orientation, and port design for back-up Calibogue Sound discharge.
		5. Implementation of this alternative would set precedent for similar management concepts elsewhere on the island.	
		6. Federal participation would not be provided to any alternative which would support increased urban runoff into SA waters.	

* Cost includes Calibogue Sound outfall as backup system. Use of another backup system will modify that portion of costs.

Island-wide Plan

EPA recognizes and supports the need for wastewater management planning for the remainder of the island. While this EIS proposes no funding actions or permitting decisions outside of the Sea Pines PSD - Forest Beach PSD, possible wastewater management alternatives for other areas of the island are identified and discussed herein.

These investigations have focused on alternative outfall configurations to serve as a back-up to the maximum reuse of treated wastewater within each service area. The back-up systems evaluated include the following:

(1) Single outfall into Port Royal Sound for areas outside the Sea Pines PSD - Forest Beach PSD.

(2) Single outfall into the Atlantic Ocean for areas outside the Sea Pines PSD - Forest Beach PSD, or for the entire island including the Sea Pines PSD - Forest Beach PSD.

(3) Pumping of treated wastewater from the entire island to the Savannah River for discharge, either via the mainland or via Daufuskie Island.

Several basic observations are drawn from these and previous evaluations.

(1) Costs for a two outfall scheme (Calibogue Sound - Port Royal Sound) are significantly lower than costs for a single outfall into the Atlantic Ocean to serve the entire island.

(2) Under the two outfall scheme, total costs are not significantly affected by whether Broad Creek PSD is pumped north to a Port Royal backup outfall, or south to a larger Calibogue Sound backup outfall in conjunction with the Sea Pines PSD - Forest Beach PSD.

(3) Costs for discharge to the Savannah River via the mainland are slightly lower than via Daufuskie Island (and more environmentally acceptable). The Savannah River alternative, regardless of route, is over twice the cost of the next most costly alternative - a single outfall into the Atlantic Ocean for the entire island.

PART D. AGENCY DECISION

Decision

The Final EIS finds that wastewater reuse with a backup system is the preferred alternative for wastewater management in the Sea Pines - Forest Beach PSD service area. The backup system can be a discharge to Calibogue

Sound, an Ocean outfall, or any other approved system that will meet Federal, State, and local requirements. The exact location of any surface water discharge would have to be determined based on further studies and evaluation of technical criteria applicable to the proposed discharge. If another method of backup is selected, studies to determine design, discharge locations, and operability would have to be conducted. Any proposed backup system would be reviewed and approved by EPA and DHEC prior to initiation of construction. An appropriate public notification will be given regarding any approval actions by EPA of any proposed backup system.

The major elements of the preferred system include (1) installation of advanced treatment at the Sea Pines PSD Treatment Plant sufficient to meet a 5 mg/l limit for suspended solids, (2) construction of a treated wastewater distribution system, (3) construction of a backup system for periods of heavy rainfall and unusual operating conditions and (4) elimination of the current direct discharge to Lawton Canal. This alternative promotes wastewater reuse by means of golf course, open space, and lawn irrigation. DHEC has appropriate legal authority to insure that the backup system is only used during periods of heavy rainfall and unusual operating conditions.

Although not preferred, secondary treatment with discharge to Calibogue Sound has been found to be the most cost-effective alternative. The amount of Federal funding participation is limited by law to the appropriate share of this most cost-effective alternative. This alternative has been estimated to have a net present worth cost of $1.8 million and a capital cost of $2.0 million. The selected alternative for this EIS is the preferred system described above involving wastewater reuse. This system is an Alternative/Innovative System.

The EIS identifies non-point source pollution as the most significant source of surface water degradation on Hilton Head Island. To address this problem, EPA will undertake a study to evaluate non-point source pollution within the Sea Pines - Forest Beach PSD service area. In addition, EPA participation in funding of the selected wastewater reuse alternative is contingent upon certain actions being taken at the PSD and local government level. Further details are provided in Chapter II.

The EIS proposes no funding actions or permitting decisions in other parts of the island. However, there are some measures which if adopted would encourage reuse, conserve water resources, and promote the implementation of appropriate wastewater management techniques. Specific recommendations are presented in Chapter II. Coordination of the selected wastewater reuse alternative for the Sea Pines - Forest Beach PSD with the implementation of wastewater management programs elsewhere on the island is also discussed in Chapter II.

The preceeding recommended actions for Hilton Head encourage the maximum reuse of treated wastewater throughout the island. The life of potable water resources would be extended, existing and future surface water quality conditions should be improved, and a long term implementable option for wastewater management would be in place.

Grant Conditions

EPA has imposed certain grant conditions which are required prior to construction of the selected wastewater reuse alternative. These actions will serve to mitigate direct impacts related to the construction and operation of the wastewater reuse alternative and will also address secondary impacts related to non-point pollution. They are detailed in Chapter II.

Mitigative Measures

In addition, EPA recommends various measures which should be implemented to lessen the impacts of future population growth on the natural and man-made environment of Hilton Head. These measures are listed in Chapter II, and most are the responsibility of the local Beaufort County government and/or the new City of Hilton Head Island. The appropriate government should move to implement these actions as soon as possible.

PART E. PUBLIC PARTICIPATION

Public participation programs are mandated by Federal regulations governing the preparation of Environmental Impact Statements. Public participation is an important and valuable part of the EIS process because it provides for active public involvement in developing and evaluating wastewater management alternatives.

At the beginning of the Hilton Head Island EIS, a public participation program was established to provide opportunities for interested groups, individuals, and government agencies to participate in the development of the EIS. The focal point of this program was the establishment of a Review Committee. This group served in an advisory capacity to EPA and their consultants. Specific functions and duties of the group included:

- Identifying local planning and environmental objectives
- Identifying study area issues and conflicts regarding wastewater management and environmental conditions
- Reviewing all task report submissions
- Assisting in the development and evaluation of wastewater management alternatives
- Reviewing Draft and Final Environmental Impact Statements

The Review Committee met at regular intervals throughout the development of the EIS. In addition, EPA and their consultants met upon request with individual members of the Review Committee or with the groups they represented. A series of meetings were also held with the NAACP Board throughout development of the EIS and two public meetings were conducted at various stages in the process.

A public hearing on the Draft EIS was held on June 23, 1982 and comments received thereafter. Chapter IV of this Final EIS provides responses to comments which were raised, and Chapter V presents a complete list of agencies and interest groups who were asked to comment.

FINAL ENVIRONMENTAL IMPACT STATEMENT
HILTON HEAD ISLAND WASTEWATER FACILITIES

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FINAL ENVIRONMENTAL IMPACT STATEMENT
HILTON HEAD ISLAND WASTEWATER FACILITIES

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CHAPTER I

BACKGROUND

CHAPTER I - BACKGROUND

PART A. INTRODUCTION

The Hilton Head Island Environmental Impact Statement is being prepared to address the provision of wastewater management facilities to serve existing and future needs.

PART B. GEOGRAPHICAL SETTING

Hilton Head Island lies off of the southeastern tip of South Carolina about thirty miles northeast of Savannah, Georgia. Hilton Head is one of the barrier islands along the Atlantic and Gulf Coasts and is the largest oceanfront island between New York and Florida. The island is approximately twelve miles long, up to five miles wide, and covers approximately forty-two square miles.

The Atlantic Ocean borders Hilton Head to the east, Calibogue Sound to the south, and Port Royal Sound to the north. Skull Creek, which comprises a link of the Intracoastal Waterway, separates Hilton Head from the mainland. Broad Creek, a seven-mile tidal inlet which opens to Calibogue Sound, cuts diagonally across the island. Plate I-1 illustrates these features.

PART C. DEVELOPMENT PATTERNS

Hilton Head is largely devoted to resort development. Over half of the island is developed according to the "plantation" concept. These planned unit developments contain residential, recreational, and occasional neighborhood commercial land uses. A second type of development is also resort-oriented but is made up of apartment and condominium complexes. A third type of development is rural residential, found on lands owned by persons who lived on the island before resort development was undertaken. Nodes of commercial and office/institutional development are located along Highway 278 near Hilton Head Plantation, at Sea Pines Circle, at Forest Beach, and at Pineland Mall. The Harbour Town shopping district is located within the gates of Sea Pines Plantation.

Hilton Head was part of unincorporated Beaufort County until the recent passage of an incorporation referendum. The Cities of Beaufort and Port Royal have adopted zoning ordinances, but the County has not. At present, there is no zoning on Hilton Head Island.

Development within the plantations has been orderly and predictable; approximately 17,500 of the island's 28,000 acres are currently owned by plantation developers, all of whom have filed masterplans with the Beaufort County Joint Planning Commission. The rate of development and ultimate land uses have been much more difficult to predict for areas outside of the plantations, because there is no master land use plan or density controls. The pattern, density, and timing of development on the island has major implications for the type and location of wastewater facilities as well as other community facilities and services.

PART D. EXISTING WASTEWATER MANAGEMENT

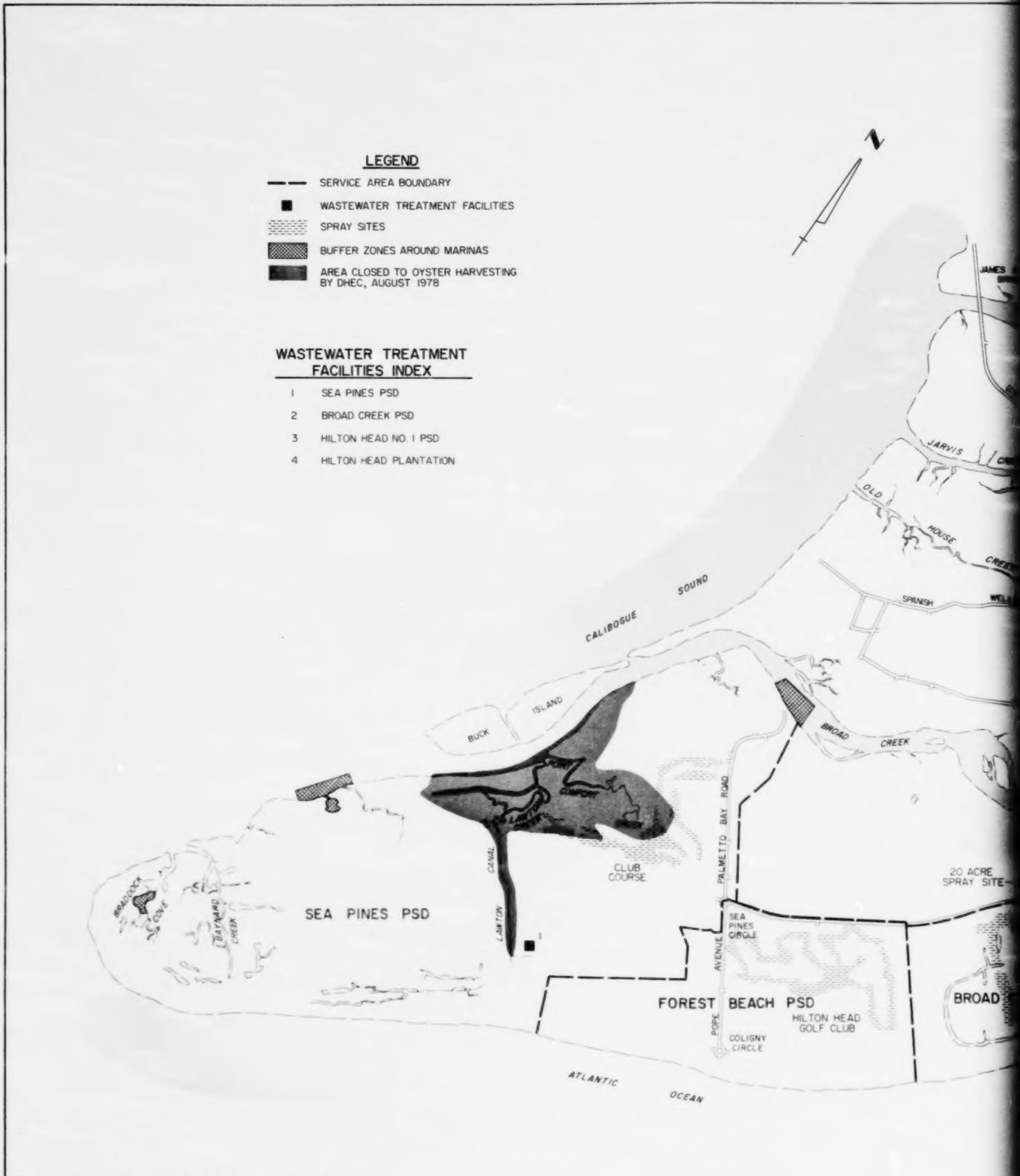
Wastewater collection and treatment for the island is principally provided by designated public service districts, which have been established by State enabling legislation. Four public service districts (PSD's) are located on the island.

- Sea Pines Public Service District
- Forest Beach Public Service District
- Broad Creek Public Service District
- Hilton Head No. 1 Public Service District

Each public service district (PSD) operates its own wastewater treatment and disposal facilities, with the exception of the Forest Beach PSD. Wastewater is conveyed from Forest Beach to the Sea Pines PSD for treatment and disposal.

Hilton Head Plantation is served by treatment facilities owned and operated by the Hilton Head Plantation Utilities Corporation. The Long Cove Club and Jenkins Island-Windmill Harbor, both under development, will be served by their own wastewater facilities. The remaining rural areas of the island utilize septic tank - drainfield systems.

Treated effluent from the wastewater facilities on the island are disposed of by several methods. Approximately 60 percent of the treated wastewater is used to irrigate the golf courses on the island. Treated wastewater is also sprayed onto areas of open land as a supplement to golf course irrigation. Present wastewater flows from the Sea Pines PSD - Forest Beach PSD exceed the total irrigation demands of the golf courses located within Sea Pines and Shipyard Plantations. As a result, up to 1.8 million gallons per day (mgd) of treated wastewater are discharged into Lawton Canal and thence to Lawton Creek which is classified for shellfishing. Existing spray areas for each PSD are displayed on Plate I-1.



N
LEGEND
SERVICE AREA BOUNDARY
WASTEWATER TREATMENT FACILITIES
SPRAY SITES
BUFFER ZONES AROUND MARINAS
AREA CLOSED TO OYSTER HARVESTING BY DHEC, AUGUST 1978
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2 BROAD CREEK PSD
3 HILTON HEAD NO. 1 PSD
4 HILTON HEAD PLANTATION
JAMES
JARVIS
OLD HOUSE
SPANISH
CALIBOGUE SOUND
BUCK ISLAND
BROAD CREEK
LAWTON CANAL
CLUB COURSE
PALMETTO BAY ROAD
20 ACRE SPRAY SITE
BRADDOCK COVE
BATHARD CREEK
SEA PINES PSD
1
SEA PINES CIRCLE
POPE AVENUE
FOREST BEACH PSD
HILTON HEAD GOLF CLUB
COLIGNY CIRCLE
BROAD
ATLANTIC OCEAN

SOURCE: 1. SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL, BUREAU OF SPECIAL ENVIRONMENTAL PROGRAMS, SHELLFISH SECTION.

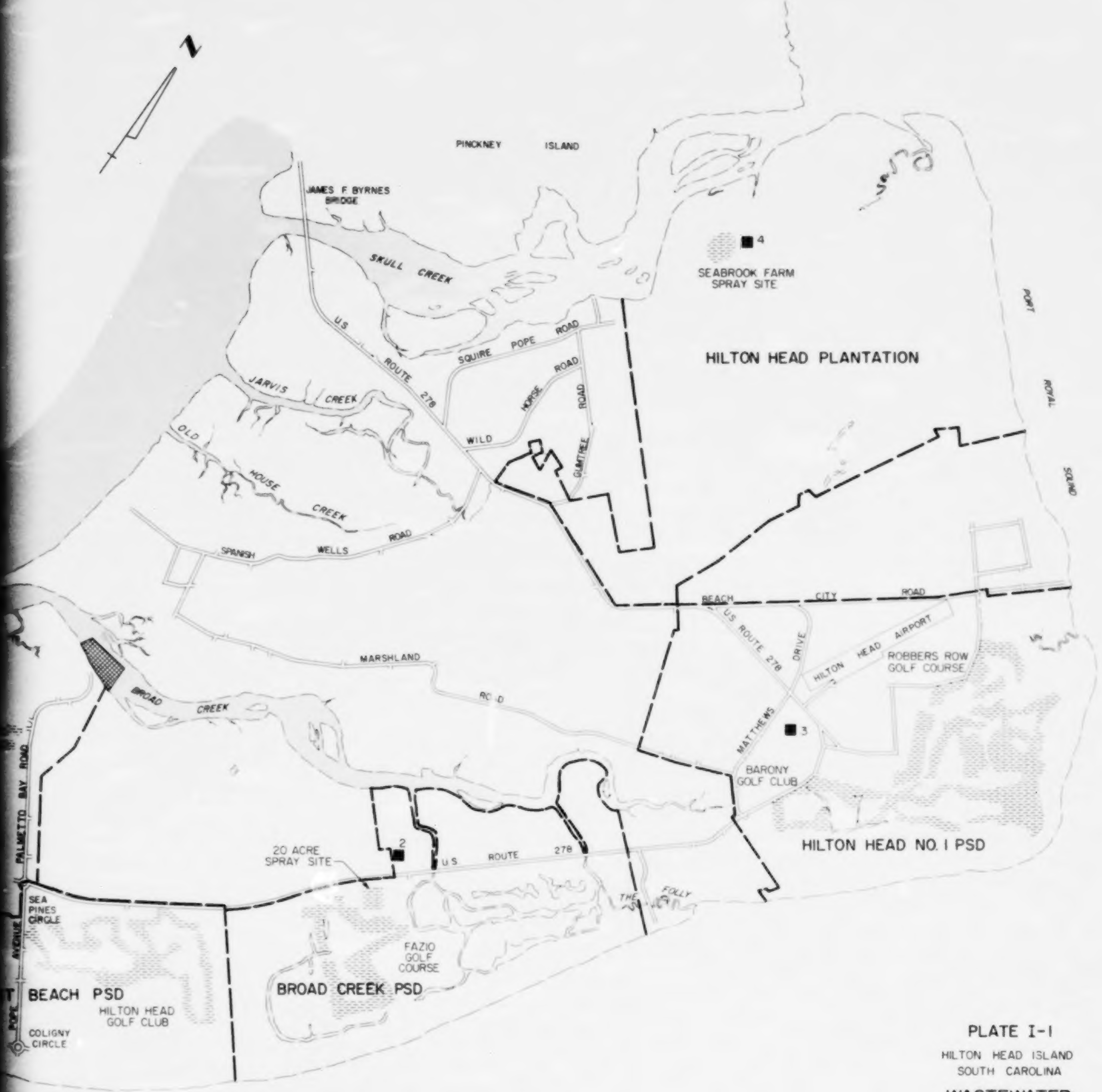
N
PINCKNEY ISLAND
JAMES F BYRNES BRIDGE
SKULL CREEK
4
SEABROOK FARM SPRAY SITE
PORT ROYAL SOUND
US ROUTE 278
SQUIRE POPE ROAD
HILTON HEAD PLANTATION
JARVIS CREEK
HORSE ROAD
WILD
GUMTREE ROAD
OLD HOUSE CREEK
SPANISH WELLS ROAD
BEACH CITY ROAD
US ROUTE 278
DRIVE
HILTON HEAD AIRPORT
ROBBERS ROW GOLF COURSE
MARSHLAND ROAD
BROAD CREEK
MATTHEWS
3
BARONY GOLF CLUB
PALMETTO BAY ROAD
2
20 ACRE SPRAY SITE
US ROUTE 278
HILTON HEAD NO. I PSD
THE FOLLY
SEA PINES CIRCLE
POPE AVENUE
FAZIO GOLF COURSE
BEACH PSD
HILTON HEAD GOLF CLUB
BROAD CREEK PSD
COLIGNY CIRCLE

PLATE I-1

HILTON HEAD ISLAND
SOUTH CAROLINA

WASTEWATER FACILITIES AND DISPOSAL AREAS

3000 0 3000 6000

SCALE IN FEET

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV ATLANTA, GEORGIA

PART E. LOCAL WATER QUALITY

During the early portion of the 1977-1978 oyster season the Shellfish and Recreational Waters Division of the South Carolina Department of Health and Environmental Control (DHEC) found fecal coliform counts which exceeded standards during routine investigation of oyster meats from the shell stock (raw unshucked oysters) of the Hilton Head Oyster Company. These high oyster meat coliform counts were again encountered upon sampling a second time in May 1978. Subsequent investigations and interviews with harvesters established that these oysters had been taken from Lawton Creek. Analyses of surface water samples from Lawton Creek in July 1978 revealed total and fecal coliform counts which exceeded standards. In August 1978 DHEC closed shellfish beds from "all waters and bottoms of Lawton Creek and Point Comfort Creek and the adjacent shore of Broad Creek running the length of Buck Island and Marsh". Prior to this time harvesting of oysters had only been prohibited by DHEC from "the waters and bottoms within a 1000 ft. radius of Palmetto Bay Marina, Harbour Town Marina and Baynard Cove Marina". These areas of closures are shown in Plate I-1.

These closures have since resulted in a number of special water quality studies by DHEC and one study by the U. S. Public Health Service, Food and Drug Administration, Shellfish and Sanitation Branch. These studies concentrated on the bacterial and/or hydrologic characteristics of the Sea Pines PSD Wastewater Treatment Plant, Lawton Canal, Lawton Creek, and Broad Creek. From these studies it was determined that (1) closure of these areas to shellfish harvesting was supported by water quality data and (2) there were indications that bacterial contamination arising from non-point sources in the Lawton Creek - Broad Creek drainage area was significant.

PART F. PURPOSE OF AND NEED FOR EIS

Because of these environmental complexities and the uniqueness of Hilton Head as a barrier island, the Environmental Protection Agency decided to prepare an Environmental Impact Statement with respect to wastewater management facilities to serve the existing and future populations of Hilton Head Island. Subsequently, a Notice of Intent was issued by the EPA Regional Administrator in April 1979.

During the EIS process a number of major issue areas were identified. The following issues were determined to be the most significant:

1. The identification of a method or combination of methods for disposal of treated wastewater effluent, adequate for year 2000 capacity and compatible with the water quality standards designated by the South Carolina Department of Health and Environmental Control (DHEC), and compatible with the Special Area Management Plan for Hilton Head Island adopted by the South Carolina Coastal Council.

2. The determination of the capacity for spray irrigation of treated wastewater effluent on the island and the impacts resulting from this wastewater disposal alternative,

3. The magnitude and causes of non-point source pollution on the island and the relationship of this pollution source to the evaluation of alternatives,

4. The extent and cause of septic tank failures on the island,

5. The disparity between OBERS Series E population projections and indicated trends based on historical growth, platted property holdings, and developer's plans and the resulting disparity in future wastewater flow projections as it impacts the need for wastewater treatment and disposal facilities, and

6. The impacts from growth supported by the provision of wastewater facilities and measures to minimize adverse effects from projected development.

Concurrent with the Hilton Head EIS, the South Carolina DHEC conducted a study of the Lawton Creek - Broad Creek watershed to better define the extent to which non-point and point sources influence their bacterial characteristics. Water quality and bacteria samples were collected during dry and wet climatic periods in order to evaluate the extent of point and non-point source contamination. A program of groundwater sampling was also conducted within Sea Pines in order to obtain additional data. These studies confirmed the existence and magnitude of non-point contamination of Lawton Creek. Exact sources of the non-point problem were not identified as an output of this study.

Additional non-point work was performed under the 208 program by the firm of Moore Gardner & Associates, under the direction of an advisory committee representing local, state, and Federal governments. The study developed effective management practices to abate non-point pollution resulting from island development. Findings and recommendations from the 208 effort are now before the Beaufort County Council for their consideration.

CHAPTER II

AGENCY DECISION

CHAPTER II - AGENCY DECISION

PART A. SEA PINES PSD - FOREST BEACH PSD

The Final EIS finds that wastewater reuse with a backup system is the preferred alternative for wastewater management in the Sea Pines - Forest Beach PSD service area. The backup system can be a discharge to Calibogue Sound, an Ocean outfall, or any other approved system that will meet Federal, State, and local requirements. The exact location of any surface water discharge would have to be determined based on further studies and evaluation of technical criteria applicable to the proposed discharge. If another method of backup is selected, studies to determine design, discharge locations, and operability would have to be conducted. Any proposed backup system would be reviewed and approved by EPA and DHEC prior to initiation of construction. An appropriate public notification will be given regarding any approval actions by EPA of any proposed backup system.

The major elements of the preferred system include (1) installation of advanced treatment at the Sea Pines PSD Wastewater Treatment Plant sufficient to meet a 5 mg/l limit for suspended solids, (2) construction of a treated wastewater distribution system, (3) construction of a backup system for periods of heavy rainfall and unusual operating conditions and (4) elimination of the current direct discharge to Lawton Canal. This alternative promotes wastewater reuse by means of golf course, open space and lawn irrigation.

Although not preferred, secondary treatment with discharge to Calibogue Sound has been found to be the most cost-effective alternative. The amount of Federal funding participation is limited by law to the appropriate share of this most cost-effective alternative. This alternative has been estimated to have a net present worth cost of $1.8 million and a capital cost of $2.0 million. The selected alternative for this EIS is the preferred system described above involving wastewater reuse. This system is an Alternative/Innovative System.

An experimental wastewater disposal system utilizing wetlands is currently being implemented in the Sea Pines Forest Preserve. This system may be continued if locally desired. EPA may assist DHEC and the Sea Pines - Forest Beach PSD in a sampling and analysis program to monitor the wetlands disposal system if the program is continued. The wetlands analysis would be designed to monitor biological changes and water quality effects due to the wastewater discharge. This site specific investigation could be of significant value to DHEC and EPA in evaluating the effects of this discharge.

PART B. NON-POINT SOURCE

The EIS identifies non-point pollution as the most significant source of surface water degradation on Hilton Head Island. To address this problem, EPA will undertake a study to evaluate non-point source pollution within the Sea Pines - Forest Beach PSD service area. The non-point source study will be designed to identify the sources of pollution, evaluate means to minimize the contribution from these sources and to identify the means to implement appropriate measures. Wetlands will be evaluated as one means for non-point pollution treatment.

The facilities recommended to be constructed as part of the selected alternative may support development that adds to the non-point problem. Therefore, EPA will provide funds only if progress is being made in solving the non-point source problem. Progress is defined as passage of an ordinance by Beaufort County or the City of Hilton Head Island addressing on-lot retention for new construction and a commitment by the Sea Pines - Forest Beach PSD and Beaufort County to participate in the EPA study to specifically address the existing non-point source problem.

PART C. REMAINING AREAS OF THE ISLAND

This EIS proposes no funding actions or permitting decisions for other parts of the island. However, there are some measures which if adopted would encourage reuse, conserve water resources and promote the implementation of appropriate wastewater management techniques. The specific recommendations are:

1. DHEC, the PSD's and local developers should formulate an agreement to provide wastewater management service for the island. This agreement should include a specific delineation of service area boundaries.

2. The number of service areas should be minimized and the existing wastewater systems should be integrated within each service area.

3. Facilities capable of meeting a 5 mg/l suspended solids limit should be provided at each treatment plant to maximize the reuse potential of the treated wastewater.

4. Available spray capacity of each service area should be adequate for the total expected daily effluent requirements under normal operating conditions.

5. Construction of the collection, treatment, and distribution systems should be coordinated to avoid foreclosing available reuse options.

6. The reuse of advanced treated wastewater should be extended to landscape areas, buffer areas, and residential lawn irrigation heretofore not approved for secondary treated effluent.

7. A backup system should be provided for use in periods of heavy rainfall and unusual operating conditions. The backup system can be a discharge to Port Royal Sound, an Ocean outfall, or any other approved system that will meet Federal, State, and local requirements. Discharges from such backup systems should be limited to periods when these unusual operating conditions exist.

8. The total number of outfalls should be minimized, preferably two or less. Significant adverse impacts to productive shellfish waters should be avoided through proper siting and operation of such outfalls.

9. Water conservation measures should be adopted and incorporated into new construction.

Based upon the foregoing, the selected wastewater reuse alternative for the Sea Pines - Forest Beach PSD can easily be coordinated with wastewater management programs elsewhere on the island.

PART D. BASIS OF DECISION

The preceeding recommended actions for Hilton Head would encourage the maximum reuse of treated wastewater throughout the island. This action would provide significant relief to the growing problems associated with groundwater supply. Allowing EPA funds to be used to resolve the Sea Pines - Forest Beach wastewater management problems supports this island-wide reuse concept.

Also, the provision that no Federal funds be provided unless Beaufort County and the Sea Pines - Forest Beach PSD demonstrate a commitment to address the non-point source problem provides an incentive to help resolve a pressing water quality problem on the island. The funding by EPA of a more specific study of the existing non-point source problem in Sea Pines will further increase the chances of improving existing water quality in this area.

The experimental wetlands wastewater disposal system to the Forest Preserve may be implemented and evaluated if locally desired. The wetlands will also be evaluated to determine if this area is a viable option for treatment of non-point source pollution. Careful monitoring of the wetlands discharge system will identify any significant adverse impacts sufficiently early to avoid long term loss of the resource.

Most of the major problems affecting the management of water resouces in the Hilton Head area are addressed by these proposed actions. The life of potable water resources would be extended, existing and future surface water quality conditions should be improved, and a long term implementable option for wastewater management would be in place.

PART E. GRANT CONDITIONS

The following actions are required prior to construction of the selected wastewater reuse alternative. These actions will serve to mitigate direct impacts related to the construction and operation of the wastewater reuse alternative and will also address secondary impacts related to non-point pollution.

1. If a Calibogue Sound outfall or an Ocean outfall is selected as the backup, detailed studies are required during design to determine the optimal location and orientation of the backup outfall/diffuser structure into Calibogue Sound or into the Atlantic Ocean. These studies should develop outfall and diffuser designs; alignment and depth of discharge; and effluent plume location, mixing, and dilution. If another method of backup is selected, studies to determine design, discharge locations, and operability would have to be conducted. Any proposed backup system would be reviewed and approved by EPA and DHEC prior to initiation of construction.

2. Appropriate monitoring programs must be developed to insure the proper use of the backup systems. These programs will be approved by DHEC.

3. An appropriate monitoring program must be developed for the wastewater reuse system to deter any adverse impacts.

4. An acceptable erosion control plan must be developed prior to construction of the pipeline crossing of South Beach for a Calibogue Sound backup outfall, or the crossing of Atlantic Ocean beaches for an Ocean outfall.

5. No construction for a Calibogue Sound or Ocean outfall through the beach and surf zone shall be accomplished during the period of May 1 through October 15 to avoid adverse impact to the loggerhead turtle.

6. A site specific archeological survey is required of areas to be affected by the selected alternative.

7. A site specific vegetative survey is required of areas to be affected by the selected alternative.

8. Beaufort County or the City of Hilton Head Island must adopt an effective ordinance which addresses on-lot retention of storm water runoff for new construction.

9. The County and the Sea Pines PSD - Forest Beach PSD must agree to participate in EPA's Sea Pines - Forest Beach non-point study.

PART F. MITIGATIVE MEASURES

The following are recommended measures which should be implemented to lessen the impacts of future population growth on the natural and man-made environment of Hilton Head. Most of these measures are the responsibility of the local Beaufort County government and the new City of Hilton Head Island. The appropriate governing body should move to implement these actions as soon as possible.

1. Surface Water Quality

   -Development of a more extensive water quality baseline of the entire island so that data exist against which to measure future water quality changes and assess the significance of any changes.

   -Consideration of using wetlands for urban runoff treatment.

   -Control of discharges from bilges and sanitary facilities of commercial and pleasure boats, particularly within estuarine and marine waters. More stringent enforcement of Coast Guard regulations.

   -A policy by local regulatory bodies to discourage the construction of new marinas that adversely affect productive shellfish waters.

   -Implementation of recommendations of the Hilton Head Island 208 Non-Point Study and the Hilton Head Land Use Plan related to water quality.

2. Surface Water Quantity

   -Relief of localized flooding of unpaved roads at the north end of the island. Drainage improvements should be made by the Public Works Department of the responsible local government. Such activity should be planned very carefully to assure that additional non-point source pollution does not result.

3. Groundwater Quality and Quantity

   -Implementation of a water conservation program via public education and changes to the plumbing code so as to decrease demand on the groundwater resource.

4. Terrestrial Ecosystems

   -Enforce regulations of the U. S. Army Corps of Engineers, the South Carolina Coastal Council, and the Beaufort County Development Standards Ordinance which restrict the development of wetlands, oceanfront beaches, and primary dunes.

5. Aquatic Ecosystems

-Implementation of previously discussed mitigative measures affecting surface water quality.

6. Population

-Implementation of local controls to plan population densities on the island consistent with local community development goals.

7. Land Use

-Strengthening of the Development Standards Ordinance to control building densities within a site and ensure provision of desired open space.

-Adoption of a Land Use Plan to control strip development along Highway 278, regulate densities, buffer incompatible land uses, and regulate nuisances.

8. Recreation

-A more active role by citizens and island representatives in the preparation of the County and City capital budgets to provide for public recreation.

-Cooperation between local government and oceanfront developers to provide public access easements to beaches where possible.

9. Transportation

-Upgrading of unpaved county roads.

-Provision of bikeway systems and sidewalks.

-Increased and more efficient signalization.

10. Community Services and Facilities

-Coordination of detailed community facilities and capital budgeting and land use planning.

-Adequate funding of island needs by county government and new city government.

CHAPTER III

CHANGES AND ADDITIONS TO THE DRAFT

CHAPTER III - CHANGES AND ADDITIONS TO THE DRAFT

PART A. INTRODUCTION

Since the preparation and publication of the Draft EIS, several changes and additions have been made to reflect new information that has been received. The following parts describe the new information, their impacts on wastewater management alternatives, and the revisions and/or additions made as a result.

PART B. SOUTH CAROLINA COASTAL COUNCIL SPECIAL AREA MANAGEMENT PLAN

The South Carolina Coastal Council has adopted a Special Area Management Plan for Hilton Head Island which establishes policy with respect to new projects or the expansion and significant alteration of existing projects or activities. Among other things, policy is set forth regarding the discharge of treated sewage into the surface waters of Hilton Head Island.

The following policies are established with respect to the discharge of treated wastewater into the surface waters of Hilton Head Island.

(1) No discharge of primary or secondarily treated effluent into the critical areas of Hilton Head Island. This recommendation does not preclude the evaluation of ocean discharge or any other innovative technologies found to be acceptable by the South Carolina Coastal Council. In the event that an ocean discharge is found to be acceptable, the S. C. Coastal Council will consider the location of the discharge at the most appropriate location.

(2) Any method of effluent disposal, other than land application on the island, will be evaluated on the basis of a comprehensive island-wide solution to the short and long term requirements of Hilton Head Island and the surrounding natural systems.

(3) In view of the critical future potable water requirements for Hilton Head Island, and the fact that little information is now available concerning present use, quantity and quality of the existing ground water, the S. C. Coastal Council recommends that the appropriate parties undertake comprehensive studies to determine the quantity and quality of potable water resources for Hilton Head Island to accommodate future growth predictions.

The final evaluation of wastewater management alternatives, as presented in this Final EIS, is consistent with Council policy.

The Special Area Management Plan also addresses other areas of impact including stormwater runoff, tidal and freshwater wetlands, beaches and dunes, public access, and cultural resources; and sets forth appropriate management policies. Compliance with these policies is largely a matter for local and state authorities.

A copy of the Special Area Management Plan for Hilton Head Island is included as Appendix A to this Final EIS.

PART C. CUBIT ENGINEERING LTD. CALIBOGUE SOUND DYE STUDY

The Cubit Engineering Limited dye study performed for the Sea Pines Public Service District evaluates water quality impacts from the discharge of a secondarily-treated effluent into Calibogue Sound.

The study consisted of a numerical model analysis of the Calibogue Sound system to simulate the tidal hydraulics of the area and the behavior of the effluent within the Sound and its tributaries if continuously discharged into the system. A field study was also performed by Cubit to obtain data for model calibration. Tide stage, current velocity, and other physical data were obtained to describe the hydrodynamics of the Sound. Tracer dye was injected at the outfall site and monitored through a floodtide cycle to provide information on the dispersion and excursion characteristics of the system.

The investigation concludes that the discharge of 3 million gallons per day of a secondarily-treated effluent into Calibogue Sound would have no impact on the dissolved oxygen or fecal coliform of the Sound or its tributaries. These findings support the conclusions of previous water quality modeling work performed as part of the Low Country 208 planning program. EPA has evaluated the Cubit Engineering study and finds it to be an acceptable basis from which to evaluate water quality impacts.

A copy of the complete report prepared by Cubit Engineering Limited is included as Appendix B to this Final EIS.

PART D. WASTEWATER MANAGEMENT ALTERNATIVES

Since publication of the Draft EIS, the various wastewater management alternatives for the Sea Pines Public Service District - Forest Beach Public Service District have been recosted to reflect revised wastewater flow projections and to bring the costs up-to-date. In addition, several new alternatives have been formulated for Sea Pines - Forest Beach and the remainder of the island. These revisions and additions are presented below. The alternatives presented in the Final EIS are based upon updated wastewater flows for the major service areas as noted on the following page.

Service Area	Peak Wastewater Flow
Sea Pines PSD - Forest Beach PSD	4.5 mgd
Broad Creek Public Service District	2.4 mgd
Hilton Head No. 1 PSD	2.8 mgd
Gardner-Matthews Plantation	1.1 mgd
Hilton Head Plantation	2.0 mgd

Sea Pines PSD - Forest Beach PSD

Wastewater Reuse Alternative - This alternative is based upon the alternative proposed by the Sea Pines Public Service District at the Draft EIS public hearing. Additional information on the Sea Pines proposal was requested by EPA in a letter dated August 3, 1982; this information was provided by the Public Service District by letter dated September 1, 1982 and carefully considered in the Final EIS decision. Copies of the August 3 and September 1 letters are included as Appendix C to this Final EIS.

The wastewater reuse alternative emphasizes the maximum reuse of advanced treated wastewater for golf course, open space, and lawn irrigation; advanced treatment will provide a suspended solids concentration of 5 mg/l prior to reuse. The increased reuse of wastewater for irrigation purposes will significantly reduce withdrawals from the Ocala Aquifer and help conserve the island's potable water supply.

Plate III-1 indicates the location of approximately 130 acres of existing irrigated land in Sea Pines and South Forest Beach that is adjacent to or near the golf course irrigation distribution mains now in place from the Sea Pines treatment plant to the respective golf courses. This existing irrigation network would be extended to provide for the use of treated effluent for irrigation in these and other areas. No cross connections to the District's potable water system will be allowed.

As part of the reuse alternative, the experimental wetlands discharge system located within the Forest Preserve may continue to be evaluated in an effort to reestablish diminishing wetlands. Periods of drought and diversion of natural recharge have dried up many wetlands areas in the Preserve thereby drastically altering the natural habitat.

During periods of heavy rainfall, irrigation needs may be insufficient to utilize all of the treated wastewater from the Sea Pines plant. Consequently, a supplemental back-up system is required for the reuse alternative. The back-up system can be a discharge to Calibogue Sound, an Ocean outfall, or any other approved system that will meet Federal, State, and local requirements.

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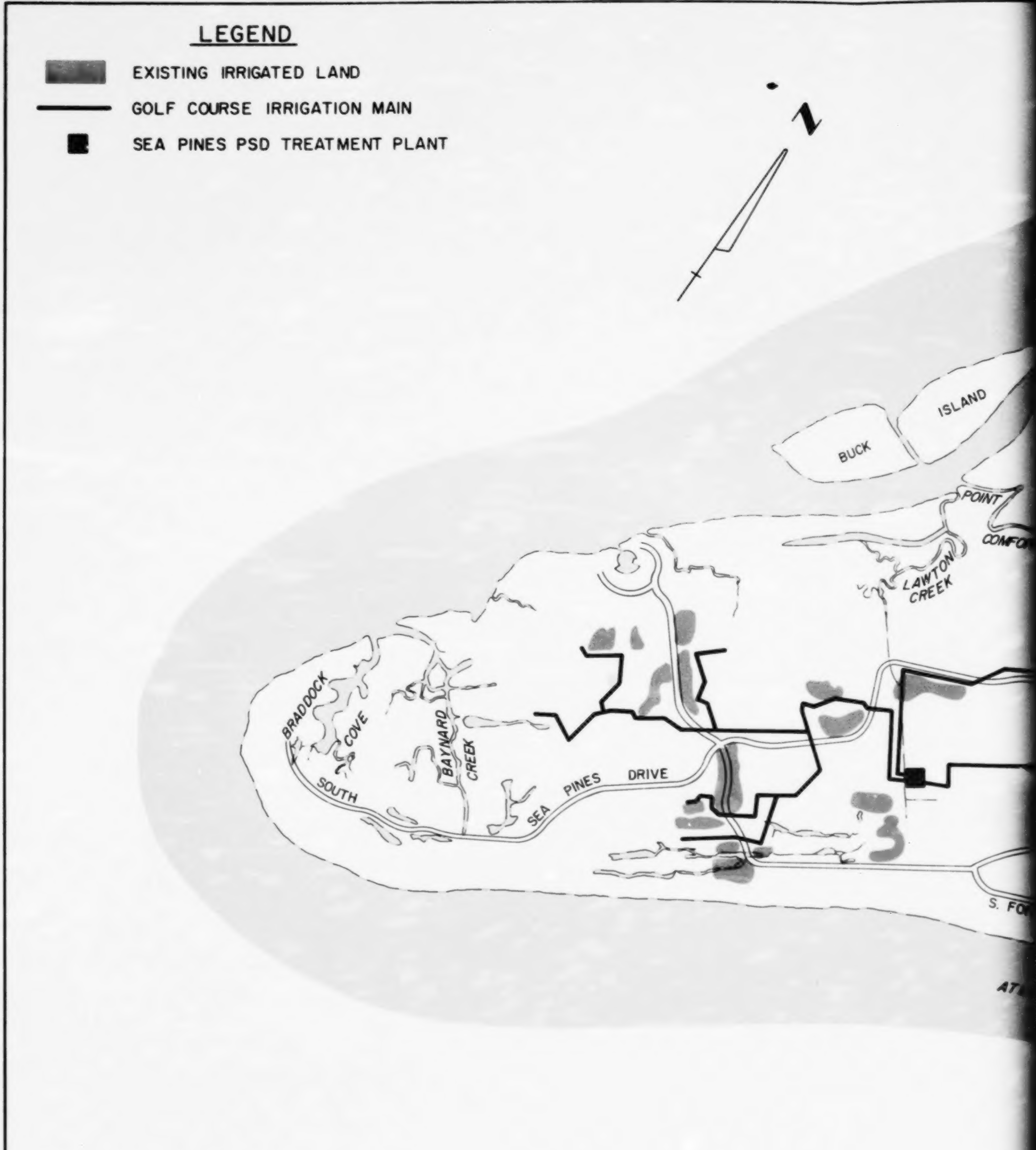
LEGEND
EXISTING IRRIGATED LAND
GOLF COURSE IRRIGATION MAIN
SEA PINES PSD TREATMENT PLANT
N
BUCK
ISLAND
POINT
COMFO
LAWTON CREEK
BRADDOCK
COVE
BAYNARD
CREEK
SOUTH
SEA
PINES
DRIVE
S. FO
AT

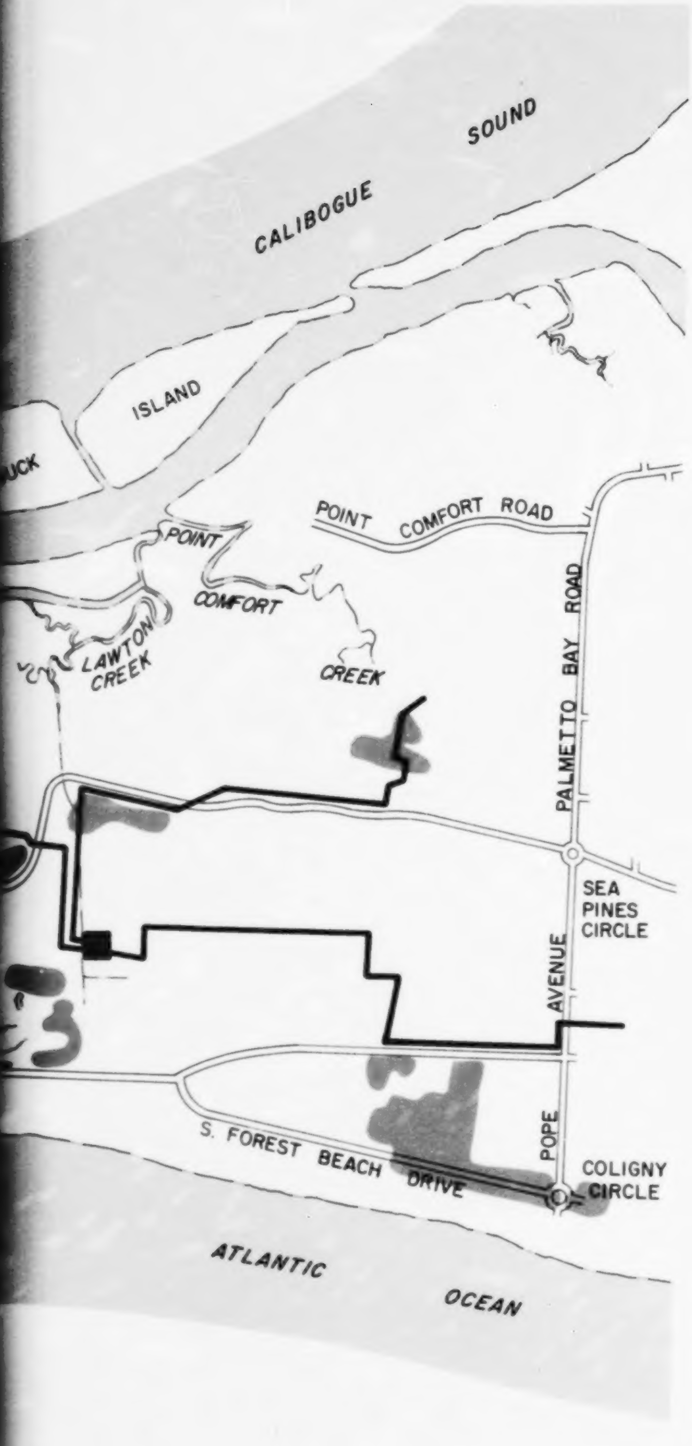
CALIBOGUE SOUND
UCK
ISLAND
POINT COMFORT ROAD
POINT
COMFORT
CREEK
LAWTON CREEK
PALMETTO BAY ROAD
SEA PINES CIRCLE
AVENUE
POPE
S. FOREST BEACH DRIVE
COLIGNY CIRCLE
ATLANTIC OCEAN

PLATE III - 1

HILTON HEAD ISLAND
SOUTH CAROLINA

EXISTING IRRIGATED LAND

3000 0 3000 6000
SCALE IN FEET

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV ATLANTA, GEORGIA

Summary of Alternatives - A summary of the updated costs of the Sea Pines - Forest Beach alternatives are presented below, based upon a wastewater flow of 4.5 mgd.

Alternatives	Equivalent Annual Cost
Lawton Canal w/Sand Filters	$ 192,300
Calibogue Sound w/o Sand Filters	312,600
Atlantic Ocean Outfall w/o Sand Filters	516,100
Wastewater Reuse *	605,700
Rapid Infiltration	1,070,400
Gardner Matthews	1,537,400
Union Camp Mainland	$ 1,624,000

Descriptions of each alternative listed above are provided in the Executive Summary of this document, and Table ES-1 provides a summary of the major environmental impacts and implementability considerations for each.

Island-wide Wastewater Management

While this EIS proposes no funding actions or permitting decisions outside of the Sea Pines PSD - Forest Beach PSD, possible wastewater management alternatives for other areas of the island have been evaluated. These investigations have focused on alternative outfall configurations to serve as a back-up to the maximum reuse of treated wastewater within each service area. The back-up systems evaluated include the following:

(1) Single outfall into Port Royal Sound for areas outside the Sea Pines PSD - Forest Beach PSD.

(2) Single outfall into the Atlantic Ocean for areas outside the Sea Pines PSD - Forest Beach PSD, or for the entire island including the Sea Pines PSD - Forest Beach PSD.

(3) Pumping of treated wastewater from the entire island to the Savannah River for discharge, either via the mainland or via Daufuskie Island.

Several basic observations are drawn from these and previous evaluations performed for Sea Pines - Forest Beach.

(1) Costs for a two outfall scheme (Calibogue Sound - Port Royal Sound) are significantly lower than costs for a single outfall into the Atlantic Ocean to serve the entire island.

(2) Under the two outfall scheme, total costs are not significantly affected by whether Broad Creek PSD is pumped north to a Port Royal backup outfall, or south to a larger Calibogue Sound backup outfall in conjunction with the Sea Pines PSD - Forest Beach PSD.

* Cost includes Calibogue Sound outfall as backup system. Use of another backup system will modify that portion of cost.

(3) Costs for discharge to the Savannah River via the mainland are slightly lower than via Daufuskie Island (and more environmentally acceptable). The Savannah River alternative, regardless of route, is over twice the cost of the next most costly alternative - a single outfall into the Atlantic Ocean for the entire island.

The coordination of the selected alternative for the Sea Pines PSD - Forest Beach PSD with wastewater management programs elsewhere on the island is discussed in the Executive Summary and in Chapter II.

Summary of Costs

Table III-1 presents a summary of design flows, project costs, operation and maintenance costs, net present worths, and equivalent annual costs for the Sea Pines - Forest Beach alternatives and for the alternative back-up outfall configurations for the remainder of the island.

PART E. EPA NON-POINT SOURCE STUDY

EPA has initiated a special study of non-point source pollution in the Sea Pines - Forest Beach area. The study is designed to identify the sources of pollution which are leading to the continued closure of shellfishing waters and to evaluate means to minimize the contributions from these sources.

The initial phase of the study is focusing on a delineation of drainage patterns and flows in the area. After this information has been collected, a sampling and lab analysis program will be developed to better identify the sources of pollution. Additional phases of the study will be designed based upon the outputs of this work.

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TABLE III-1

COST SUMMARY FOR HILTON HEAD ISLAND WASTEWATER MANAGEMENT ALTERNATIVES(1)

No.	Description	Design Flow (mgd)	Project Cost	Land Cost	Salvage Value	Annual O & M Cost	Total Present Worth	Equivalent Annual Cost
A-1	Calibogue Sound Outfall	4.5	$ 2,830,100	--	$ 1,356,000	$ 31,270	$ 2,696,600	$ 312,600
2	Calibogue Sound Outfall	4.77	3,465,500	--	1,672,100	36,470	3,282,900	380,600
3	Calibogue Sound Outfall	7.42	5,368,100	--	2,588,300	57,540	5,094,800	590,700
B-1	Lawton Canal w/Sand Filters	4.5	1,331,000	--	450,500	53,500	1,659,400	192,300
C-1	Atlantic Ocean Outfall	4.5	4,922,100	--	2,450,300	29,950	4,451,800	516,100
2	Atlantic Ocean Outfall	4.77	5,185,500	--	2,571,800	35,150	4,723,900	547,700
3	Atlantic Ocean Outfall	7.42	8,728,100	--	4,345,800	56,220	7,920,800	918,329
D-1	Rapid Infiltration/Woodlands Irrigation	4.5	2,687,700	8,725,000	9,998,500	91,940	9,232,700	1,070,400
2	Rapid Infiltration/Woodlands Irrigation/ Calibogue Outfall	4.5	4,893,100	8,725,000	11,159,900	97,400	11,139,800	1,291,500
E-1	Spray Irrigation @ Gardner Matthews w/Calibogue Outfall	4.5	7,511,800	10,350,000	14,155,000	170,540	15,124,000	1,753,500
2	Spray Irrigation w/o Calibogue Outfall	4.5	5,355,300	10,350,000	13,026,900	165,590	13,260,000	1,537,400
F-1	Spray Irrigation at Union Camp w/Calibogue	4.5	13,187,500	3,450,000	10,041,300	257,300	15,871,000	1,840,100
2	Spray Irrigation at Union Camp w/o Calibogue Outfall	4.5	11,031,000	3,450,000	8,913,300	252,350	14,007,200	1,624,000
G	Wastewater Reuse/Sand Filters/ Calibogue Outfall	4.5	5,133,500	--	2,315,200	90,270	5,223,900	605,700

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(1) All cost in 1985 Present Worth based upon 15-year planning period ending in the year 2000, 7.875 percent interest and 1983 price levels.

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TABLE III-1

COST SUMMARY FOR HILTON HEAD ISLAND WASTEWATER MANAGEMENT ALTERNATIVES(1)
(continued)

No.	Description	Design Flow' (mgd)	Project Cost	Land Cost	Salvage Value	Annual O & M Cost	Total Present Worth	Equivalent Annual Cost
H-1	Port Royal Sound Outfall	6.18	$ 3,750,300	--	$ 1,785,800	$ 53,060	$ 3,676,900	$ 426,300
2	Port Royal Sound Outfall	8.83	5,422,800	--	2,581,600	74,760	5,300,000	614,500
I-1	Atlantic Ocean Outfall (Gannett Fleming Rte)	13.6	14,767,600	--	7,329,100	109,100	13,529,300	1,568,600
2	Atlantic Ocean Outfall (Thomas & Hutton Rte)	13.6	19,350,900	--	9,726,500	111,240	17,418,200	2,019,500
J	Savannah River Via Daufuskie Island	13.6	39,838,700	--	20,443,200	444,410	37,593,000	4,358,500
K	Savannah River Via Mainland	13.6	30,332,200	--	15,470,600	438,250	34,112,200	3,421,600

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(1) All cost in 1985 Present Worth based upon 15-year planning period ending in the year 2000, 7.875 percent interest and 1983 price levels.

CHAPTER IV

PUBLIC PARTICIPATION

CHAPTER IV - PUBLIC PARTICIPATION

PART A. INTRODUCTION

A public hearing on the Draft EIS was held on June 23, 1982 and comments received thereafter. Major issues, comments, and responses are presented in Part B of this chapter. Comments and responses are cross-referenced to the actual public hearing transcript and written comments which are reproduced in Part C.

PART B. COMMENTS AND RESPONSES

The following substantive issues have been raised through comments and new developments since publication of the Draft EIS. Responses are provided for each in light of EPA's Final Decision.

ISSUE NO. 1 - NON-POINT SOURCE POLLUTION

Several persons and interests commented regarding non-point source pollution on Hilton Head Island. All were concerned with the water quality impacts resulting from non-point source pollution; it was agreed that these existing impacts would only become worse in the future unless effective action is taken. Some commenters supported EPA's action to condition funding for additional wastewater facilities upon demonstrated progress toward solving the non-point source problem. While others concurred with the EPA conclusion regarding the magnitude of non-point source pollution, these commenters believed the Draft EIS to be lacking because it did not offer any specific solutions.

The purpose of the Hilton Head EIS is to select a wastewater management program for the island and to determine the extent of Federal participation in the funding of the program. Consequently, wastewater management alternatives were formulated and evaluated and their environmental impacts assessed. During this process ancillary issues were considered including the impacts of existing and future non-point source pollution.

Substantial work related to the non-point source problem was performed concurrently with the EIS process, most notably the special studies conducted by DHEC and the 208 effort. Data and findings from these investigations have been recognized and incorporated into the Hilton Head EIS.

The Hilton Head EIS concludes that non-point source pollution is a major water quality consideration for the study area. While the development of specific non-point solutions is beyond the scope and purpose of the EIS, the non-point source problem has been carefully considered throughout, and EPA has identified it as the most significant source of surface water degradation. Recognizing the need for abatement, EPA has conditioned funding for the Sea Pines PSD - Forest Beach PSD preferred alternative upon demonstrated progress in solving the non-point source problem.

Progress is defined as passage of an ordinance by Beaufort County requiring on-lot retention for new construction and a commitment by the Sea Pines PSD - Forest Beach PSD to participate in a study to specifically address the existing non-point source problem. EPA will direct this study which will identify the sources of non-point source pollution, evaluate methods to minimize the contribution from these sources, and identify the means to implement appropriate control measures.

ISSUE NO. 2 - POPULATION AND WASTEWATER FLOWS

Several commenters questioned the basis for the population projections for Hilton Head Island, and hence questioned the projected wastewater flows. The focus of these comments relate to the disparity between the OBERS Series E population projections used to determine the level of EPA funding of wastewater facilities and the indicated trends based on historical growth, platted property holdings, and developer's plans.

Methodology

Population projections were made at two levels: (1) from the OBERS base and (2) from information gathered from the Beaufort County Joint Planning Commission (JPC). These projections were then disaggregated among the public service districts, the Hilton Head Plantation, and areas of the island outside of the existing PSD boundaries. Both sets of projections were based upon historical occupancy rates for rental units and seasonal residents and therefore, in some cases, are considerably less than 100 percent occupancy.

In order to establish the maximum needs for the treatment and disposal capacity for existing service areas, it is assumed that the existing PSD areas and the Hilton Head Plantation will be 100 percent sewered by the year 2000. This assumption is made to assure that planning considers fully adequate facilities and that worst case environmental impacts can be evaluated. However, it is not intended to preclude the use of existing on-lot systems that are functioning properly or the use of on-lot systems for new construction where soils are suitable.

Based upon the population disaggregations for the year 2000, the assumption of 100 percent sewer service, and per capita wastewater flow rates for various population components, wastewater flows were projected for each of the PSD's, the Hilton Head Plantation, and the non-PSD areas of the island. They represent the daily flow of the highest monthly average flow to be expected in the year 2000 based upon historical occupancy rates for rental units and seasonal residents.

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Wastewater management alternatives were formulated and evaluated principally for the Sea Pines PSD - Forest Beach PSD. Where on-going wastewater facility construction met or exceeded projected flows, the "no action" alternative with respect to EPA funding was judged to be the only alternative.

Concerns

In general, the commenters indicated that the OBERS wastewater flows were unrealistic. In many instances, the projections made by the individual service areas also exceeded the higher JPC-based wastewater flows presented in the Draft EIS. While the commenters recognized that EPA funding must be constrained to the OBERS level, they expressed the legitimate concern that use of lower wastewater flows would preclude the identification of possible wastewater management plans for the entire island and could possibly lead to the duplication of wastewater facilities among the various service areas.

Resolution

These comments and concerns have been carefully considered in the Final EIS. While this EIS proposes no funding actions or permitting decisions outside of the Sea Pines PSD - Forest Beach PSD, possible wastewater management alternatives for other areas of the island are identified and discussed herein.

The wastewater management alternatives evaluated in the Final EIS are based upon updated JPC population projections. These population projections which were developed in the Hilton Head land use planning effort, were used to generate updated flow projections for the major service areas as follows:

Service Area	Peak Wastewater Flow
Sea Pines PSD - Forest Beach PSD	4.5 mgd
Broad Creek Public Service District	2.4 mgd
Hilton Head No. 1 PSD	2.8 mgd
Gardner-Matthews Plantation	1.1 mgd
Hilton Head Plantation	2.0 mgd

ISSUE NO. 3 - NEW WASTEWATER MANAGEMENT ALTERNATIVES

At the June 23, 1982 public hearing on the Draft EIS the Sea Pines Public Service District outlined an alternative management program to handle wastewater from the Sea Pines PSD and Forest Beach PSD service areas. The alternative emphasized reuse of advanced treated wastewater for golf course, open space, and lawn irrigation; the Forest Preserve wetlands discharge system; and discharge of advanced treated wastewater into Lawton Canal during periods of extreme rainfall.

Additional information on the Sea Pines alternative was requested by EPA in a letter dated August 3, 1982; this information was provided by letter dated September 1, 1982 and carefully considered in the Final EIS process.

The Final EIS endorses the Sea Pines proposal to provide for maximum reuse of treated wastewater; advanced treatment will be provided to achieve a suspended solids concentration of 5 mg/l prior to reuse. The experimental wetlands discharge system may continue to be implemented in an effort to reestablish diminishing wetlands within the Forest Preserve. A backup system is required for periods of heavy rainfall and unusual operating conditions.

Detailed information and discussion of the EPA alternative is provided elsewhere in the Final EIS.

ISSUE NO. 4 - WASTEWATER REUSE AND WATER CONSERVATION

There was overwhelming support expressed during the comment period for the reuse of treated wastewater for irrigation purposes on the island, to relieve demands on the Ocala Aquifer. EPA endorses this concept.

The recommended wastewater management program for the Sea Pines PSD - Forest Beach PSD service area promotes the reuse of treated wastewater for beneficial purposes through golf course, open space, and lawn irrigation and through the experimental use of the Forest Preserve wetlands. The use of treated wastewater for golf course, open space, and lawn irrigation will significantly reduce withdrawals from the Ocala Aquifer; it is hoped that the experimental wetlands system will restore diminishing wetlands within the Sea Pines Forest Preserve without adversely impacting the ecosystem.

In addition to the reuse of treated wastewater, EPA supports the use of water-saving and flow-reducing techniques to lessen water supply demand. It is recommended that Beaufort County implement the use of water-saving devices in all new construction, and that the Public Service Districts on Hilton Head encourage water conservation among their customers.

ISSUE NO. 5 - CALIBOGUE SOUND DISCHARGE

Many comments were received regarding the discharge of treated wastewater to Calibogue Sound and the assimilative capacity of the receiving waters. Most of the comments expressed concern over the use of chlorine as a disinfectant, and others suggested that discharge be at ebb tide.

EPA believes that chlorination is the most effective means of disinfection for use in the selected wastewater irrigation program. The use of chlorine for disinfection has been standard practice for years. Significant adverse impacts are not expected to occur from the periodic discharge of chlorinated wastewater into Calibogue Sound. Although Calibogue Sound is a very sensitive resource, the intermittent nature of the discharge should mitigate any potential problems. In addition, any wastewater discharge will have been treated to an advanced level in order to provide a solids-free effluent. Because the chlorine demand of the final effluent will be lessened, the chlorination process can be more easily controlled. As a result, the potential for over-chlorination will be virtually eliminated.

The Cubit Engineering study of a Calibogue Sound discharge, performed for the Sea Pines Public Service District, supports the EPA position (and that of previous studies) regarding the negligible effect of such discharge on the water quality of Calibogue Sound. Consequently, EPA does not believe that an ebb-tide only discharge is required.

ISSUE NO. 6 - CUBIT ENGINEERING DYE STUDY

Several commenters observed that the Cubit dye study was conducted at the lowest current of the year and hence questioned its validity. Others questioned the mechanism for vertical mixing of the wastewater with the overlying water column.

The Cubit Engineering study of Calibogue Sound has been evaluated by EPA and found to provide an acceptable basis from which to evaluate water quality impacts.

The conduct of the dye study at the lowest current of the year provides a worst-case evaluation of water quality impacts (due to lack of dispersion) and therefore does not alter the validity of the conclusions. Vertical mixing of the wastewater with the overlying water column will be accomplished through the rise of the wastewater to the surface due to its lesser density than the more saline receiving waters.

While the Cubit study addresses the predicted impacts of a Calibogue Sound discharge, it does not eliminate the need for additional work. To further minimize impacts, detailed studies will be required during design to determine the optimal location and orientation of the backup outfall/diffuser structure. These studies should develop outfall and diffuser design; alignment and depth of discharge; and effluent plume location, mixing, and dispersion. These studies are required prior to construction.

ISSUE NO. 7 - CORPS OF ENGINEERS COMMENTS

The Corps of Engineers has commented regarding (1) the protection of significant cultural resources and (2) requirements for a Department of the Army permit for certain construction activities.

Construction of the selected alternative is not anticipated to impact any significant cultural resources. An archeological survey of the pipeline to Calibogue Sound is required to insure avoidance of such impacts. EPA will comply with current legislation and regulations to avoid or mitigate any potential impacts.

The Charleston District of the Corps of Engineers has been contacted regarding permit requirements for subaqueous pipelines. A permit will be required for a Calibogue Sound or Ocean backup outfall and diffuser.

ISSUE NO. 8 - BIOLOGICAL ASSESSMENT AND ENDANGERED SPECIES

The United States Department of the Interior has commented regarding the possible presence of any endangered or threatened species, listed or proposed to be listed, which may be present in the impact area of the proposed project.

The following is a list of endangered or threatened species which are believed to possibly be present in the Hilton Head Study Area.

1. American alligator (Alligator mississippiensis) - Threatened
2. Loggerhead turtle (Caretta caretta) - Threatened
3. Bald eagle (Haliaeetus leucocephalus) - Endangered
4. Brown pelican (Pelecanus occidentalis) - Endangered
5. Florida manatee (Trichechus manatus) - Endangered

In addition there are several marine species, including the endangered shortnose sturgeon (Acipenser brevirostrum), which may occur in the project area and for which the National Marine Fisheries Service has responsibility.

The selected alternative has been evaluated with respect to possible impacts upon these endangered and threatened species. Construction of the pipeline crossing of South Beach for a Calibogue Sound backup outfall may impact the nesting period for the loggerhead turtles. As a grant condition, EPA will require that an acceptable erosion control plan and construction schedule be developed to avoid this potential impact. All other construction activity will be in already disturbed areas and should have no impact on any of these species. The quality of the wastewater that is now being sprayed on the golf courses will be improved as part of this project.

ISSUE NO. 9 - ISLAND-WIDE WASTEWATER MANAGEMENT

Several commenters indicated the need for a wastewater management plan for the entire island, regardless of EPA's funding and permitting constraints.

Despite the Draft EIS focus on the Sea Pines PSD - Forest Beach PSD, EPA recognizes and supports the need for wastewater management planning for the rest of the island.

The following actions are recommended.

1. DHEC, the PSD's, and local developers should formulate an agreement to provide wastewater management service for the island. This agreement should include a specific delineation of service area boundaries.

2. The number of service areas should be minimized and the existing wastewater systems should be integrated within each service area.

3. Facilities capable of meeting a 5 mg/l suspended solids limit should be provided at each treatment plant to maximize the reuse potential of the treated wastewater.

4. Available spray capacity of each service area should be adequate for the total expected daily effluent requirements under normal operating conditions.

5. Construction of the collection, treatment and distribution systems should be coordinated to avoid foreclosing available reuse options.

6. The reuse of advanced treated wastewater should be extended to landscape areas, buffer areas, and residential lawn irrigation heretofore not approved for secondary treated effluent.

7. A backup system should be provided for use in periods of heavy rainfall and unusual operating conditions. The backup system can be a discharge to Port Royal Sound, an Ocean outfall, or any other approved system that will meet Federal, State and local requirements.

8. The total number of outfalls should be minimized, preferably two or less. Significant adverse impacts to productive shellfish waters should be avoided through proper siting and operation of such outfalls.

9. Water conservation measures should be adopted and incorporated into new construction.

Alternatives for island-wide wastewater management are presented and discussed elsewhere within the Final EIS.

ISSUE NO. 10 - CONSOLIDATION OF PSD'S AND TREATMENT PLANTS

Many comments were received regarding the duplication of wastewater facilities, the coordination of wastewater management programs, and the possible consolidation of the various Public Service Districts.

The 201 Facilities Plan evaluated various combinations of wastewater treatment facilities for Hilton Head. In addition to the continued treatment of wastewater by the individual public service districts, several more regional concepts which would involve a lesser number of treatment facilities were considered. The recommended alternative called for the continued operation of the existing PSD treatment facilities based upon the high costs of pumping wastewater long distances to a single location for treatment.

The EIS concurs in this finding, especially in view of the Final EIS objective to provide for the maximum reuse of advanced treated wastewater throughout the island. The consolidation of the existing PSD treatment facilities to a central facility would not only require extensive pumping of raw wastewater to a central location for treatment, but also the repumping of treated wastewater back to individual irrigation sites.

However, EPA does not support the proliferation of small package wastewater treatment plants on the island nor the creation of numerous new service areas beyond those presently existing. Rather, EPA supports the coordination of wastewater management programs among the various PSD's on Hilton Head and has recommended the following actions in its Final Decision.

(1) DHEC, the PSD's, and local developers should formulate an agreement to provide wastewater management service for the island. This agreement should include a specific delineation of service area boundaries.

(2) The number of service areas should be minimized and the existing wastewater systems should be integrated within each service area.

(3) The total number of backup outfalls should be minimized, preferably two or less. Significant adverse impacts to productive shellfish waters should be avoided through proper siting and operation of such outfalls.

ISSUE NO. 11 - CONTINUED USE OF ON-LOT SYSTEMS

Several persons commented regarding the continued use of septic tanks on the island and the need for a more comprehensive maintenance program for existing systems.

EPA believes that the continued use of on-lot systems on Hilton Head Island is acceptable where soils, groundwater depth, and site conditions are suitable. The EIS has not identified any areas on the island where widespread septic tank malfunctions are known to occur.

EPA supports the development of appropriate monitoring programs in areas relying upon septic tanks by the Beaufort County Health Department and the South Carolina Department of Health and Environmental Control. Regular inspection and maintenance guidelines should be established and implemented as part of this program.

ISSUE NO. 12 - PROVISION OF SEWERAGE TO UNSEWERED COMMUNITIES

Several comments were received regarding the extension of sewerage service to areas of the island that are presently unsewered.

As discussed in the answer above, EPA has not identified significant public health or environmental problems in the non-sewered areas of Hilton Head that would necessitate the extension of sewer service at this time. Should such problems occur in the future, an appropriate wastewater management program can be implemented. Several alternatives were presented in the Draft EIS and cost estimates given as a function of population and distance from existing sewers.

In its Final Decision, EPA has recommended that DHEC, the PSD's and local developers formulate an agreement to provide wastewater management service to the island. This agreement should include a specific delineation of service area boundaries.

PART C. HEARING TRANSCRIPT AND WRITTEN COMMENTS

Copies of the public hearing transcript and of the written comments received thereafter are provided in this part. They are cross-referenced to the issues and responses presented in Part B of this chapter.

CONTENTS OF PUBLIC HEARING TRANSCRIPT

A copy of the June 23, 1982 hearing transcript follows. Persons giving statements at the hearing, their representation, and the pages of the transcript which their statement encompasses is provided below.

PERSON	REPRESENTING	TRANSCRIPT PAGES
Robert C. Cooper	EPA Region IV	7 - 22
Roger E. Davis	South Carolina DHEC	23 - 25
Mac Burdette	South Carolina Coastal Council	26 - 27
Steve Hopkins	South Carolina Wildlife & Marine Resources Department	28 - 29
Arnold Ellison	Sea Pines Public Service District	29 - 36
Grand Moorehouse	Hilton Head Island Commission	37 - 43
Leslie Teal	Citizen	44 - 52
W. L. Longnecker	Association of Sea Pines Plantation Property Owners, Island Concerns Committee	54 - 55
Charles Golson	Citizen	56 - 57
Donald Hook	Hilton Head Island Community Association	57 - 64
Bea Cheil	League of Women's Voters	65 - 68
Carroll Dailey	May River Committee	68 - 72
Perry White	N.A.A.C.P., Hilton Head Chapter	73 - 75
Bob Gale	Sierra Club, Nancy Cathcart Group	76 - 79
Thomas Barnwell	Citizen	79 - 81
Emory Campbell	Citizen	81 - 82

HILTON HEAD ISLAND, SOUTH CAROLINA
DRAFT ENVIRONMENTAL IMPACT STATEMENT
PUBLIC HEARING

Proceedings held in the Hilton Head Elementary School, Hilton Head Island, South Carolina, on the 23rd day of June, 1982, at 7:30 P.M., reported by Edmund W. Ruchalski, Certified Court Reporter, B-538.

Cerbone and Ruchalski
Certified Court Reporters

Beverly A. Cerbone
Edmund W. Ruchalski

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Savannah, Georgia 31412
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HEARING OFFICER: We're a little past time so I would like to formally open the Public Hearing, and begin with our comments. First of all let me tell you that my name is Howard Zeller. And I'm the assistant regional administrator of the United States Environmental Protection Agency. My office is in Atlanta, Georgia. And I will be Hearing Officer here tonight for this hearing. The purpose of the hearing is to develop a record and to receive comments on the Draft Environmental Impact Statement, which was recently issued relative to the waste treatment facilities here on Hilton Head Island. I want to welcome all of you to the hearing. And I want you to understand that it's your hearing and it's for the purposes of information, and I want you to feel free to participate. If you have not filled out a card when you came in and indicated your interest in making a statement at this hearing, I would ask you to please do so or let me know otherwise. And even if you do not wish to make a statement, you should fill out a card because this becomes part of our official record. And it's our way of notifying you of the results of this hearing. So it's very important that you be registered for the hearing so that we have a complete record of the events.

Now I have a number of things that I'm obligated to get into the record, so if you'll bear with me I'm going to go through my notes here and make sure that we have a legal document developed, and we'll add a few things into the record before we get into the actual making of statements. First of all the hearing tonight is to receive public and agency comments on the Hilton Head Island, South Carolina 201 Area Environmental Impact Statement. The Draft EIS addresses the proposed wastewater facilities for Hilton Head Island.

Now with me tonight at the hearing on my immediate left is Roger Davis, who is the Deputy Commissioner of the Department of Health and Environmental Control for the State of South Carolina. On my immediate right is Bob Howard, Mr. Howard is on my staff and he heads up the National Environmental Policy Compliance Group. In other words he is in charge of preparation of all Environmental Impact Statements for the eight states of region four. Mr. Robert Cooper who is further over on my right is the Project Officer for this particular EIS. Mr. Cooper has been intimately involved with this project for several years now, probably about three years, and has followed its development. And he's the person that's largely responsible for the document that we have tonight. And he'll be making a statement later on to discuss it.

Let me ask now are there, I always like to do this at hearings, are there any elected officials that are here at this hearing? If so I would like to acknowledge your presence. Would you stand?

NOTE: (Spectator acknowledges himself)

HEARING OFFICER: Thank you, sir, we're very happy to have you here, appreciate your taking the time to be here. Well let me talk a little bit about the hearing itself. Under EPA Regulations the type of hearing that we have tonight is an informational hearing. In other words it's a non-adversarial meeting type hearing. There will--I will not permit any cross-examination of anyone. I may ask some questions of the people that make statements, other panel members may ask some questions. I will not necessarily allow anyone from the audience to ask questions of an individual who makes a statement, unless that would be agreeable to that person involved. But I do want to develop information, and to have an accurate record here of what this project is all about. So whatever that entails, I want to try to see that that's done.

The authority for the action tonight is found in the Statutes, if you'd care to pursue it, it's under the "Cleanwater Act" of the United States Environmental Protection Agency, and the National Environmental Policy Act. The "Cleanwater Act" says that we should hold a hearings on the 201 Project, Area Wide Planning Projects of this nature if there are Federal funds involved. And the National Environmental Policy Act says that any time there is a project that would have a, that involves Federal dollars that would have a significant impact on the environment, you shouldhave an Environmental Impact Statement prepared. So that's the statutory basis for the hearing tonight.

Now we made our decision on an EIS for the 201 Facilities Plan because we thought there would be an effect on the environment. In April of 1979 we sent a notice of our intent of the Draft Environmental Impact Statement, this document here, which I think most of you have, if you do not have there are copies available back there on the desk and summaries of it. This Draft Environmental Impact Statement was made available on May 3rd, 1982. It appeared in the Federal Register on May 14th, 1982. And as far as purposes and for purposes of comment on this document I am going to keep the comment period open to receive written comments in my office until July 9th, 1982.

Now we followed all of the applicable regulations, as far as this public hearing is concerned. We issued a public notice on April 30th. We published it in the newspapers, and all of the places that we were supposed to, and I'm pleased to see that it did have some results, because we have a good turn-out for the hearing.

Let me just comment again, relative to our reason for being here, the Environmental Protection Agency urges you to be involved in the decision making process for projects of this nature. We want you to understand what it is the agency is doing. And we encourage your participation in the hearing.

Now before we get into receiving comments from the public, I'm going to ask some of the Federal and State people to make brief statements about the hearing, so that we can get those matters into the record. Now the first person I want to call on now for purposes of the record will be Robert Cooper, who you remember I said was Project Officer of this project. And I'm going to ask Mr. Cooper to make some official comments for the record at this time. Mr. Cooper?

COMMENTS BY MR. COOPER:

Thank you, Mr. Zeller. Good evening, ladies and gentlemen. I would like to speak a few minutes tonight about the background of this EIS and the alternatives which we have been evaluating.

The 201 Facilities Plan for Beaufort County, which was completed in 1975, recommended that the effluent from all treatment plants be disposed of by spray irrigation on nearby golf courses so as not to impact area shellfish waters. While conceptually sound, this scheme was based upon golf course irrigation rates which have not been realized, particularly in the case of the Sea Pines PSD and the Forest Beach PSD. The failure of the golf courses to accept all of the wastewater has led to the continuing discharge into the SA or shellfish harvesting waters of Lawton Canal.

In August of 1978, the South Carolina Department of Health and Environmental Control closed shellfish beds in Lawton Canal and Lawton Creek, in Point Comfort Creek, and in adjacent waters of Broad Creek. These areas were closed because of high total and fecal coliform counts, which were encountered in surface water samples. Subsequent water quality studies confirmed that these violations were attributed to non-point source bacterial contamination and were not originating from the wastewater treatment facility.

Because of these environmental complexities and the uniqueness of the environment on Hilton Head, EPA decided to prepare an environmental impact statement on wastewater management facilities to serve existing and future populations of Hilton Head Island. Subsequently, a notice of intent, as Mr. Zeller indicated, was issued in April of 1978. Concurrent with the Hilton Head EIS, South Carolina DHEC initiated a study of the Lawton Creek and Broad Creek watershed to better define the extent to which non-point and point sources influenced their bacterial characteristics. These studies confirmed the existence and magnitude of non-point source contamination of Lawton Creek. Only the effluent from the Sea Pines Treatment Plant met water quality standards with any degree of consistency. Additional non-point work is now underway in Beaufort County, and is funded through what is called the 208 Program. The firm of Moore, Gardner & Associates is performing the work under the direction of an advisory committee representing Local, State and Federal Governments.

The focus of the study is to develop effective management practices which will abate non-point source pollution from Island developments. Conclusions from this work will serve as an adjunct to the findings of the EIS regarding wastewater management.

The focus of the EIS has been to develop and evaluate wastewater management systems for the Island which would accommodate projected populations, with emphasis placed on methods of disposal of the treated wastewater. The methods generally available include golf course irrigation, discharge to surface waters, land application by either spray irrigation or rapid infiltration, and discharge to wetlands.

Projected populations and wastewater flows were developed for each of the service areas on the Island and compared with on-going wastewater facility construction. Wastewater management alternatives were then formulated and evaluated with respect to costs, environmental consequences, operability, and implementability. Where on-going wastewater facility construction met or exceeded the State's allocation of allowable wastewater flows, the "No-Action" alternative with respect to EPA funding was judged to be the only alternative.

Five wastewater management alternatives have been formulated for the Sea Pines PSD-Forest Beach PSD. Each alternative includes treatment at the Sea Pines Plant, which is now being expanded to 3.25 MGD, irrigation of the five golf courses within the two PSD's and the experimental wetlands discharge system which has already been approved in concept by the South Carolina DHEC and the Coastal Council.

Even with irrigation on all five golf courses, substantial amounts of wastewater will remain, which must be handled by supplemental means. The five alternatives considered for disposal are: (1) Advanced treatment and discharge to Lawton Canal, (2) Secondary treatment and discharge to Calibogue Sound via a subaqueous outfall and diffuser; (3) Land application within the PSD's using a combination of spray irrigation at parcels within Forest Beach PSD immediately adjacent to the Hilton Head Golf Club, rapid infiltration within the Forest Preserve, and the experimental wetlands discharge system handling 1 MGD;

(4) Land application outside the PSD's by woodlands irrigation on the Gardner-Matthews Tract; and (5) Land application on the mainland by spray irrigation. Funding options for these alternatives were also considered, including a hundred percent local funding and Federal funding being contingent upon non-point source control measures being implemented at the local level.

I will briefly summarize the costs, the environmental impacts and implementability of each alternative. And this information here is contained in the hand-out which is available on the registration table.

Option A is continued discharge to Lawton Canal, the total present worth cost of $1.8 million. This alternative would allow continued discharge to shellfishing waters when other reasonable options are available. This would foreclose the chance of opening these closed shellfish waters.

The ~~side~~ size of the closed buffer zone will increase as wastewater flows increase. The selection of this alternative will set a precedent of allowing future surface water discharges into shellfish waters. Federal support would promote growth and development which would increase non-point source runoff. And a precedent of near-shore wastewater disposal could encourage other developments to abandon on-property disposal plans potentially resulting in a reduction of open space and higher densities.

The second option is construction of a new subaqueous outfall for discharge to Calibogue Sound. Total present worth cost of this alternative is also $1.8 million. This alternative would remove the unpermitted discharge to the shellfishing waters of Lawton Canal. No buffer zone closures of shellfish beds would be required. The South Carolina Wildlife and Marine Resources Department has expressed concern regarding surface water discharges to the area.

The Coastal Council has also expressed concern regarding a precedent for surface discharges and greater long-range non-point source problems based on greater ultimate population. Federal support would also promote growth and development with increased non-point runoff. A precedent of off-island wastewater disposal could encourage other developments to abandon on-property disposal plans potentially resulting in a reduction of open space and higher densities.

Recently completed dye studies and modeling analysis indicate that the proposed discharge would have a minimal impact on the environment of Calibogue Sound.

The third option is rapid infiltration within the Sea Pines Forest Preserve, and spray irrigation wtihin Shipyard Plantation. The total present worth of this alternative is gauged at $6.7 million. This system was not deemed to be technically feasible due to soil and water table conditions. This system would remove unpermitted discharge to shellfishing waters, and would not set a ~~not~~ precedent for surface discharges.

Federal support would promote growth and development, which could encourage increase non-point source runoff. Sixty-seven acres of land within Shipyard Plantation would no longer be available for other forms of development.

The fourth option is spray irrigation on the Gardner-Matthews site. The total present worth cost of this alternative is $12.6 million. Removal of unpermitted discharge to shellfish waters would result. And increases in the Island's disposal capacity would be limited by the specific capacity of the spray site.

Selection of this alternative would not provide a precedent for additional surface water discharges. Federal support would promote growth and development, and increase non-point source runoff within the capacity of the discharge site. Power of eminent domain would have to be used by the County to take land from the land owner who currently has other plans for its use.

Site specific studies will be required to determine specific spray irrigation application rates. This alternative would give the perception of a solution to the wastewater disposal problem that is limited in scope. Therefore future developments would likely be planned to manage their disposal on their own property. Lower densities and greater open space would likely result. Five hundred acres of land would no longer be available for other forms of development.

The fifth option was spray irrigation off-island. The total present worth of this alternative was $12.5 million. This alternative would lead to the removal of the unpermitted discharge to the shellfish waters of Lawton Canal. This alternative would not provide a precedent for the approval of the additional surface water discharges of wastewater. The purchase or leasing of land could potentially be negotiated without the use of eminent domain.

A precedent of off-island disposal could encourage other developments to abandon on-property disposal plans potentially resulting in a reduction of open space and higher densities on the island. Federal support would promote growth and development, which would increase nonpoint source runoff. Site specific studies will be required to determine specific spray irrigation application rates.

Option six is a No Federal Action alternative. Sea Pines - Forest Beach PSD's would implement either alternative Two, Four or Five, with one hundred percent Local funding. Again these alternatives are discharge to Calibogue Sound, spray irrigation on the Gardner-Matthews site, or spray irrigation off-island. The discharge of treated wastewater into the SA waters of Lawton Canal would be eliminated. Federal participation would not be provided to any alternative which would support increased urban runoff pollution of SA waters.

Implementation of a discharge to Calibogue Sound would provide a precedent for other surface water discharges. Site specific studies would be required on the locally selected alternative to determine the spray application rates.

The final alternative is Federal funding conditional on a non-point source solution. This option would be identical to the previous one except Federal funding would be made available if an effective implementable non-point source control program is established.

This alternative would provide for discharge to Calibogue Sound or spray irrigation on or off-island. The discharge of treated wastewater into the SA waters of Lawton Canal would be eliminated. Federal participation would not be provided to any alternative which would support increased urban runoff pollution of SA waters. Implementation of a discharge to Calibogue Sound would provide a precedent for other surface water discharges. Site specific studies would be required on a locally selected alternative to determine spray application rates if the spray irrigation alternatives were chosen.

This alternative could provide incentive for the implementation of an effective non-point source program. The preferred wastewater management alternative for the SeaPines-Forest Beach PSD's was judged by EPA to be the Federal funding conditional on non-point source solution alternative, that last one which I described. Under this alternative the Sea Pines PSD would implement the most cost-effective and implementable of these disposal options: Discharge to Calibogue Sound, spray irrigation at the Gardner-Matthews Site, or spray irrigation off-island.

Federal funding for construction would be made available consistent with State priority listing, if an effective non-point source control program was developed for the Sea Pines - Forest Beach area by the Beaufort County Government by the time the Step II Design Phase was complete.

If Federal funding is made available for Step III, facilities sized to dispose of the 1.8 MGD presently going into Lawton Canal would be eligible. Any additional capacity constructed would have to be funded with one hundred percent local funding.

Present plans of the Broad Creek PSD envision expansion of the existing 0.6 MGD treatment plant to 1.2 in 1982. A second expansion 1.2 to 1.8 is envisioned by 1984, and a third 2.4 MGD by 1988. These plans will provide capacity beyond that required for the year 2000 OBERS Population or the Joint Planning Commission Population.

Wastewater is presently sprayed on the Fazio Golf Course and an existing twenty acre spray site. As needs dictate, the Trent Jones Golf Course will also be irrigated with treated wastewater. These two courses and the existing spray site are adequate to handle the OBERS and JPC based flows projected for the year 2000. However, additional spray areas or another permissible disposal alternative may be required to match the designed capacity of the proposed 1.2 MGD plant. The cost of the Broad Creek expansion program must be borne entirely at the local PSD level. Current EPA Policy prevents their participation in funding of wastewater facilities greater than the OBERS population.

Consequently the program described above for the Broad Creek PSD represents the no-action alternative with respect to Federal funding.

The Hilton Head number one PSD wastewater facilities primarily serve apartments, condominiums, and commercial establishments located within the boundaries of the PSD.

Single-family residences within the Port Royal Plantation are served by septic tanks. Current flows average about a hundred and seventy-five thousand gallons per day. Treatment facilities were constructed in 1971 and consist of an unlined oxidation pond followed by two unlined holding ponds. Wastewater from the oxidation pond percolates into the groundwater, and DHEC has placed a moratorium on additional connections to the system.

In order to provide additional capacity private development has constructed an interim four hundred and forty thousand gallon per day treatment facility adjacent to the PSD's existing oxidation pond. Treated effluent is pumped from the plant, under route 278, to Port Royal Plantation for irrigation on two golf courses. DHEC has approved the use of these courses for spray irrigation to at least eight hundred thousand gallons per day of wastewater.

Construction is now underway for a new eight hundred thousand gallon per day plant to serve existing and future needs within this area. A completely new facility is being built because of the inadequacy of the existing unlined oxidation pond. As part of the Hilton Head number one project, the Port Royal Inn Package Plant will be abandoned and a pumping station and force main constructed to convey wastewater to the new PSD facilities. The entire project is being funded, in part, by an EPA construction grant.

The Hilton Head number one PSD has recently asked DHEC to allow the four hundred and forty thousand gallon per day interim facility to remain in operation after construction of the new plant has been completed. The existing golf courses cannot accommodate the total capacity of 1.24 MGD which would result. A third golf course in the Port Royal Plantation is planned for construction within the next four years.

Additional EPA funding will not be available for any future needs of the Hilton Head number one PSD in excess of the eight hundred thousand gallons per day facility now under construction. Therefore the cost for future expansion beyond eight hundred thousand gallons per day, and for securing additional spray irrigation areas or for an alternate disposal method must be borne totally by the PSD.

Hilton Head Plantation is served by treatment facilities owned and operated by the Hilton Head Plantation Utilities Corporation. The Hilton Head Plantation plans to expand the existing activated sludge package plant from 0.5 to 1.0 MGD during 1984, based upon anticipated housing starts. The resulting capacity will be sufficient to accommodate the year 2000 population which the plantation projects. The corporation is not eligible to receive EPA grant funds for improvements.

Areas of Hilton Head Island which lie outside the boundaries of the Hilton Head Plantation or the existing Public Service Districts are served by septic tank-drainfield systems, the exception of the Mariner's Cove Club and the Northside Trailer Park. There are no areas where widespread septic tank malfunctions are known to occur.

The septic tank-drainfield system remains the preferred system for use in the non-PSD areas where soils, groundwater depth, and site conditions are acceptable. If an area should experience septic tank failures in the future, a community-sized on-lot system could be developed or sewers extended from an adjacent PSD. Where septic tank failures occur on an individual basis, on-site improvements would be the only feasible solution.

The Mariner's Cove Plant provides treatment for the wastewater generated from forty units of the Mariner's Cove Club Complex, which is located south of Route 278, near the bridge to Pinckney Island. Effluent from the plant is spray irrigated. Its continued operation is envisioned although increased emphasis on operation and maintenance of the plant and spray system is required.

The Northside Trailer Park is located on the northern end of Hilton Head, off of Gumtree Road. Residents of the trailer park have been asked by the Hilton Head Plantation Company to vacate the property after which the existing ten thousand gallons per day package plant will be abandoned.

A major conclusion of this EIS is that the control of non-point source pollution is a significant environmental problem on Hilton Head Island. This problem will grow continually worse throughout the island regardless of which alternative is selected for the discharge of wastewater if control measures are not implemented before development intensifies. The implementation of appropriate non-point source control such as on-lot retention and treatment through natural wetland systems could significantly mitigate non-point source problems.

The implementation of the recently submitted recommendations of the 208 study by the Beaufort County Council would go a long way toward protecting water quality in the Hilton Head area from further degradation. Another important goal is the passage of land use control legislation. The control of allowable development densities is an issue of utmost importance, which must be dealt with by the Beaufort County Council if water quality is going to be maintained in the future.

A third issue of major concern in the maintenance of water quality is the proliferation of marinas in the Hilton Head area. Each new marina in SA waters requires a new buffer zone, requires that a new buffer zone area be closed to shellfish harvesting. This situation is especially critical in Broad Creek.

With this hearing tonight we are nearing the end of the EIS process. During this process, we have achieved a better understanding of the nature and extent of water quality problems in the Hilton Head area and have evaluated a wide range of wastewater disposal alternatives. EPA's selection of preferred alternatives was principally based upon the preservation of SA waters at a reasonable cost.

It is now up to the Beaufort County Council and the South Carolina Coastal Council to implement the necessary control measures with regard to non-point source runoff controls, population density controls, and proper siting of marinas. It is only when all of these issues have been properly addressed that water quality in the Hilton Head area can be improved or at a minimum maintained at its current level.

Thank you for your attention and your attendance here tonight.

HEARING OFFICER: Thank you, Mr. Cooper, that's a good summary of the events that were covered in the EIS. Next I would like to ask Mr. Roger Davis of the South Carolina Department of Health and Environmental Control to make a statement. As most of you know the State of South

Carolina has been delegated the National Pollutant Discharge Elimination System Permit Program. Now any facility that is ultimately constructed and in operation would be permitted by the State of South Carolina with EPA's concurrence. EIS is part of that process, and let me ask Mr. Davis to go ahead at this time.

COMMENTS BY MR. DAVIS:

Thank you, Mr. Zeller. I'm going to, with your indulgence, read a comparatively brief statement into the record. "The staff of the department of Health and Environmental Control has been involved with this EIS since its inception, having generated some of the information contained therein and having reviewed the work of others. It has become obvious through this process that there is no ideal solution to the problems caused, created by the population density of this barrier island.

Hilton Head is surrounded by high quality waters, despite the degree of habitation that currently exists. However violations of the water quality standards do exist because the water must be of nearly pristine quality for the harvesting of shellfish to be allowed. Studies have shown that rainwater which flows across the island collected in storm drains and discharged to the lagoons and creeks is sufficiently contaminated to be the major cause of the elevated bacteria levels in those areas which have been

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closed for shellfishing. Unless this problem which is known as non-point source pollution is solved, funds directed at up-grading of waste treatment plants will provide no added beneficial use of the surrounding waters.

A two-pronged approach to the point and non-point sources of pollution will require a high degree of local co-ordination and action. Strong local ordinances must be developed for the island as a whole for any non-point source control program to be effective. Strong consideration should also be given to water conservation measures, both as a means of protecting the limited supply of ground water and of reducing the magnitude of the waste disposal problem.

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The installation of water efficient fixtures and new construction still have a measurable impact given the build-out yet expected to occur. The Department has been concerned about the impact of the point source discharge from since the early days of the development of the island. The first indication of this concern was in 1967 when the proposed facility to discharge to the Lawton Canal area was judged to be adequate to protect the shellfish beds at the projected waste flows then projected at five hundred thousand gallons per day.

In 1970 the Department began encouraging the district to use spray irrigation as a means of waste disposal, and received positive responses. If I may at this point, I'd like to take this opportunity to clear up what I believe has been a recurring misconception. Reference has been made on numerous times to the unpermitted discharge of Sea Pines PSD, in the context of it being an illegal discharge. This characterization is inappropriate since the facility was constructed with full DHEC approval. We chose not to issue a Federal discharge permit for the facility on the basis of the District's plan to phase out the discharge. Unfortunately the plan to totally eliminate the discharge was unsuccessful. DHEC then issued an administrative order which recognized and authorized the continued discharge to Lawton Ditch, and requires the study of additional alternatives to the discharge.

This study has since been supplanted by this EIS. The study of the water quality issues on the island has been a high priority for DHEC. For two straight years the Hilton Head EIS was identified by DHEC as one of only a few major issues included in a co-ordination agreement between the agency and EPA.

After evaluating comments received here tonight, DHEC will submit detailed comments on the Draft EIS before the close of the record. Thank you.

HEARING OFFICER: Thank you, Mr. Davis. Next I'd like to call on Mr. Mac Burdette with the Coastal Planning Commission, excuse me, the South Carolina Coastal Council. The Council will be involved in any effort as far as issuance of a permit is concerned, I believe the South Carolina Law requires that the Council approve any permit before it's issued. Along those lines we would appreciate your comments for the record, sir.

COMMENTS BY MR. BURDETTE:

Thank you, Mr. Zeller, my name is Mac Burdette. I'm the planning co-ordinator for the South Carolina Coastal Council. Dr. ~~Wade~~ Wayne Beam, the executive director of the South Carolina Coastal Council asked me on behalf of the full Coastal Council membership to read the following letter. "June 17, 1982, directed to Mr. Charles Jetter, administrative director, Environmental Protection Agency, Atlanta Georgia, Dear Charles: The South Carolina Coastal Council has completed its review of the Draft Environmental Impact Statement for Hilton Head Island, South Carolina Wastewater Facilities. Pursuant to policies of the South Carolina Coastal Zone Management Plan, and to 15CFR Part 930 which reads, "Consistency for Department of Interior Outer Continental Shelf Pre-Lease Sale Activities and/or other Federal Activities directly affecting the Coastal Zone, an alternative method allowing the discharge of secondarily treated effluent in the Calibogue Sound is not consistent with the policies of the South Carolina Coastal Council. The

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Hilton Head Island Special Area Management Plan, Chapter Two, Section One, Item C states that, "No discharge of primary or secondarily treated effluent into the critical areas of Hilton Head Island shall be allowed. This policy is based upon concern for the quality of water surrounding Hilton Head Island, the possible long-term indirect impact associated with rapid development, and upon the potential establishment of precedents that could affect the entire coastal area of South Carolina. Whereas we do recognize that the EIS has issued on April 30th, 1982, is still in draft form, please be advised of the Coastal Council's concern and intentions. Should the final EIS contain this alternative in a design which would not satisfy our consistency requirements, the Coastal Council would be obliged to issue a negative determination at that time. We realize the difficulties associated with providing the necessary input (Phonetic) structure to support development.

"However, the Coastal Council's responsibities as mandated by the South Carolina General Assembly remain directed toward the preservation and enhancement of a sound natural environment for future generations. We appreciate your deliberation, and look forward to working with you to bring about an acceptable solution. Sincerely, H. Wayne Beam, Executive Director, South Carolina Coastal Council." Thank you, sir.

HEARING OFFICER: Thank you, Mr. Burdette, we appreciate your comments. You are of course correct in stating that this is a Draft Environmental Impact Statement, and the reason why we're here are to receive comments and to hear of people's concerns so that we may review the decision, the preliminary decision that was made. We appreciate your in-put to be a key party in the ultimate resolution of this project, I assure you. Next I'd like to ask Mr. Steve Hopkins, who is a regional marine biologist with the South Carolina Wildlife and Marine Resources Department. Please come forward and make a statement, Mr. Hopkins.

COMMENTS BY MR. HOPKINS:

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Ladies and gentlemen, comments from the Marine Resources Division of South Carolina Wildlife will be written out and sent to you very shortly. Basically though our position has not changed since the inception of this study three years ago. We are still opposed to the discharge of wastewater into the marine environment, whether it be through the Lawton Canal or Calibogue Sound. This opposition is based upon potentially adverse effects of various components of wastewater, such as but not limited to high concentrations of nutrients, disinfecting agents and trace metals. And more important that the Sea Pines-Forest Beach PSD outfall itself is the precedent it will set for wastewater disposal all along a rapidly developing South Carolina coastline. With regard to cost effectiveness of a particular alternative we ask EPA to heed the advice given tonight not from the PSD Commissioners or employees or the Plantation representatives, or building contractors and so forth, but rather from the people that are going to bear the burden of these alternatives, whatever it may be. It is these people who are the ones who can weigh the cost of their montly sewer bill against property values. Certainly if you degrade the environment around the island you're going to make it a less desirable place to live, and these people are going to pay for it in the long run, in a very different way. Thank you.

HEARING OFFICER: Mr. Hopkins, that's why we're here, to hear what the people have to say. Next I'd like to ask Mr. Arnold Ellison, who is manager of the Sea Pines Public Service District to please come forward and make a statement, as he's indicated he wishes to do.

COMMENTS BY MR. ELLISON:

Mr. Zeller, I'm Arnold Ellison, manager of the Sea Pines Public Service District. The Draft Environmental Impact Statement has considered a number of alternatives for wastewater disposal, and through your review process the list was narrowed down to five, for which costs ranging from 1.8 million to fifteen million dollars were identified. These items have already been identified by Mr. Cooper, so I will not go through them again. During the three plus years that the EIS has been in process, the Sea Pines Public Service District has continued to seek it's own ways to use and dispose of the treated wastewater. Some of our efforts include: (1) Continued spray irrigation on the Club course and Shipyard Golf courses, and to construct new lines to spray irrigate the Ocean, Sea Marsh, Harbor Town, and the new nine-hole course in Shipyard. This will provide spray irrigation on five and a half golf courses. All that are located within the Sea Pines and Forest Beach Public Service District.

We have gained approval for pumping treated wastewater to the forest reserve to re-establish a wetland. A three year program will be conducted to determine the quantity of water this wetland can accommodate. We will be pumping six hundred thousand gallons a day the first year, 1.0 million gallons the second year, and 1.5 million gallons a day the third year into this wetland. (3) We have conducted a study on the dispersion and environmental impact of a secondary effluent introduced to deep water at the southern tip of Hilton Head Island. We hope that we will never have to implement or to construct an outfall in Calibogue Sound, but we have felt the need to evaluate this alternative to a greater degree than you have in the EIS.

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Cubett Engineering from Clemson, South Carolina performed the study in March of this year, and their report has been made available to the EPA staff. The study has determined that there would be no adverse impact on the environment from a three MGD or million gallons per day discharge at the southern tip of Hilton Head Island. In fact, there would be no change in background concentrations of any of the perimeters. (4) We have moved ahead with the treatment plan expansion that includes an environmentally sound method of sludge disposal. We will be injecting the sludge into a sand media located at the treatment plant that has an under-drain collection system. The water removed from the sludge will be pumped back to the treatement plant and the sludge mixed with the sand media will provide a top soil that can be used for landscaping yards and flower gardens.

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(5) We have investigated actions taken by other communities in reusing treated wastewater. St. Petersburg, Florida has treated their wastewater with tertiary filters and disinfected to a degree that health officials are satisfied that viruses have been killed. This process allows the city to use treated wastewater for spray irrigation of golf courses, parks, road shoulders and medians, and landscaping of individual yards as well as for fire protection.

The results of this EIS have significant importance to the Sea Pines and Forest Beach Public Service District. In 1978 the districts received and order from the State Department of Health and Environmental Control that required a study of wastewater disposal alternatives. The EIS became this study that Mr. Davis has already referred to. Within ninety days of the EIS completion, the district must submit an engineering report detailing the concept for implementation of the selected alternative. Within two hundred and seventy days of approval of the engineering report, the district must submit plans and specifications for construction of these facilities. The facility must then be constructed in accordance with a schedule to be developed by DHEC.

If the study is finalized as presented, we will have no choice but to pursue the Calibogue Sound discharge. There are a number of items in the Draft EIS that give concern to the district. I'll enumerate them. Number One, the draft indicates that some of the alternatives for effluent disposal will allow the unbridled development of the island. We contend that denial of sewage service will only cause developers to seek ways to dispose treated wastewater on the mainland. This is, in fact, already being pursued. The added cost will then cause a higher number of units to be built to cover the increased cost of sewage treatement and disposal. We think this will cause an increase in densities, not a decrease.

The limits on development density should be handled by local ordinance, and are presently being pursued by the JPC and the Beaufort County Council. (2) The removal of the present outfall from Lawton Canal will not open any of the closed shellfish areas. Water in the Lawton Creek, Point Comfort Creek and portions of Broad Creek do not presently meet SA standards because of runoff pollution.

We realize there would have to be a buffer zone for any outfall from a treatment plant. But this buffer zone that we would have in Lawton Creek falls between two existing buffer zones, those for Harbor Town Marina and Palmetto Bay Marina.

(3) Federal funding for any of the selected alternatives would be limited to that portion of the work required to eliminate our present 1.8 MGD outfall. This is an outfall that is presented or created by our present customers. It has nothing to do with new development. This funding would be used to assist the present customers and would not be used for plant expansions for new development.

Issue No. 1

The EIS, however, prohibits any Federal funding unless a storm water runoff program is implemented for Sea Pines and Forest Beach. Neither Public Service District has authority to work in this area. And it is questionable as to the program that could be implemented. I say this because all work that's been done by the 208 Study and by the Coastal Council as well as JPC's development standard ordinance deals with runoff from new developments. None of these seem to have a solution for runoff pollution for developed areas, such as Sea Pines and Forest Beach.

Issue No. 1

We raise the question, does EPA have a suggested program for controlling or treating runoff from developed areas? If you were given the responsibility to stop contamination of oyster beds, what reasonable action could you implement?

Issue No. 4

The Sea Pines and Forest Beach Public Service Districts feel there is considerable study still needed to insure that treated wastewater is used, not disposed, to its maximum. We have a limited amount of good drinking water, and it is being used in great quantities for non-potable purposes. We would like to present our plan for moving forward. (1) Continue the three year program on the wetlands recharge and work to gain more land in the forest reserve.

Issue No. 3

Recently there was some land given to the Island Audubon Society by Mr. Don Schrater. This land and other tracts may be available for water recharge. (2) Monitor the water used on the present and new golf courses to see how much water each is using and work with golf course superintendents to try to maximize use of the treated wastewater. (3) Pursue the use of a tertiary effluent for spray irrigation throughout Sea Pines and Shipyard, not just use secondary but tertiary for everything.

Issue No. 3

The construction of the water mains to the five golf courses provides a delivery system for spraying treated wastewater on landscaped areas similar to the system used in St. Petersburg, Florida. We know that great quantities of potable water are used for these purposes, but we need to quantify this use and see how much treated effluent could be used.

(4) We would like to install tertiary filters as soon as possible so that the best quality water can be provided for spray irrigation, and that any continued discharge to Lawton Canal will meet limits of five milligrams per liter for both BOD and suspended solids. This plan is in fact one of the alternatives discussed in the EIS but has been refused.

(5) By providing a tertiary degree of treatment, we would then ask to have the limits of discharge removed so that the districts can proceed with meeting their obligations to serve. It is necessary to lift the limit on the amount discharged to Lawton Canal in order to serve the vacant lots within the already developed subdivisions and to serve the areas presently on septic tanks. Currently in Sea Pines there are nine hundred and six houses on septic tanks, this is thirty-seven percent of all the houses in Sea Pines

are still using septic tanks.

(6) At the end of a reasonable time see if we can accomplish a zero discharge. This is our desire, to have a hundred percent reuse of the wastewater. We would also like to see if County Council and Coastal Council are able to make any progress in improving the existing water quality in Lawton Creek and Broad Creek.

(7) If at the end of the designated period we have not obtained a zero discharge and if progress has been made in eliminating the non-point pollution from the developed areas, we would then pursue the other alternatives that you have indicated acceptable in the EIS. We ask your consideration in your writing the final EIS in such a way that the program I have outlined be classified as an acceptable alternative to EPA. Thank you.

HEARING OFFICER: Thank you, Mr. Ellison, you brought some new information to bear as far as the hearing is concerned. And as I indicated earlier one of our reasons for being here is to get all information and all comments relative to what we have proposed into the record. I will not comment towards your proposal at this time. That would not be appropriate. We will comment when the final Environmental Impact Statement is made. And we'll proceed at that time. I will just make a side comment. You are correct in your perception that EPA considers the non-point source problem at Hilton Head to be very severe and very critical, and something it absolutely has to get under control for the well-being of the island and all of the people that dwell on the island. Next let me ask Mr. Grant Moorehouse, who is with the Hilton Head Island Commission to please come forward and make a statement.

COMMENTS BY MR. MOOREHOUSE:

Mr. Zeller, members of your staff, ladies and gentlemen, I'm Grant Moorehouse, member of the Hilton Head Island Commission. I think it's a bad spot to be in, and I think I'm the first layman on the speaker. And that's bad. This commission recognizing that the Environmental Impact Statement primarily is a study of the Sea Pines Public Service District and the Forest Beach Public Service District, and its present and future disposal of wastewater accepts the study on it's face value with certain exceptions.

We feel that the study and its proposals present environmental problems and observations and it offers solutions which are not fully and do not fully answer the total island's future growth and its problems. Therefore our acceptance is one of acceptance of a study as a tool, a beginning point to further reconsider the problems presented. For example, (1) and I'm going to repeat, I think, a little bit of what has already been said, but this is our

Issue No. 1

observation. (1) It points out the problem and the importance of storm water runoff as a serious major problem but offers no real solution. And it further goes on to state that the 208 Study which is being done must be made adjunct to this study, and particularly as it affects the waste, the storm water runoff and septic tank runoffs, non-point pollution. But this study isn't complete at the present time. We have a problem putting the two of them together to approve the whole study.

It establishes good areas for septic tank operations with slight pollution problems. And I think it's been brought up that forty percent of Sea Pines alone is on septic tanks. And that the whole DHEC study of the Lawton Canal came up with the conclusion that Mr. Ellison's wastewater treatment plant was the cleanest water in that canal. So it's non-point pollution, and I guess that's been said.

Its wastewater, it brings up its wastewater management and disposal problems seemed based more upon economic factors than upon a long-lasting impact for our future growth. Basic observations we made of the study is (1) the non-point pollution problem. And the study points out that the non-point pollution problem must be controlled before any Federal funding is available, and yet the 208 Study is not available. And in all nine options for the Sea Pines Public Service District and the Forest Beach

District, effluent disposal studies fail to take in that the problem is non-point pollution problem. That the OBERS, we feel that the OBERS criteria for projected population is nowhere near reflective of the Island trend of growth plus tourism. It talks of fifty to sixty thousand people in future years. We know there will be forty to fifty here next month, thousand people.

Issue No. 2

It talks of Broad Creek PSD growth to a capacity of 1.2 million gallons per day in 1981 and '83, then to a figure of 1.8 in '84, and I guess there's a new figure of two point something in '88. And it doesn't speak to where that effluent will go.

It talks about discharge to the sound ocean or Port Royal fundamentally is sound. But that doesn't resolve the non-point pollution problem at all. Further conclusions and proposals, we feel that the non-point pollution problem is so serious and so immediate and such an environmental threat to the island that if the 208 Study or not, we propose the following action: We feel that in the septic tank area at present the only concern that anyone has concerning septic tanks, and that's pointed out in the study, is that of the owners when this backs up. And I dare say that there are many of us here tonight who watched it back up the last four or five days. We need to develop a monitoring system, and further where the PSD's

Issue No. 11

Issue No. 11

exist develop some sort of program to inspect, evaluate these operations and then some criteria in time that these units must go on those sewer lines, whatever those criteria is, whether it's the years they have been in operation, whether it's faulty operation causing leakage, whether it's monitoring of the local lagoons, ponds, drainage ditches or whatever. Whatever points this out and whatever criteria can be developed must be studied and done.

Issue No. 1

And the storm water runoff, we need to review the status of the 208 Study now, where are they, when is it coming, so that some conclusions can be drawn. While we don't know of any real program of an on-going study in this area and the United States, there have got to be some. And we need to evaluate these, find out where they are.

We do point out that the new DSO2 Amendments will contain requirements for developers to develop runoff systems to handle the first inch of water runoff. As stated before, we believe this to be the major problem.

Second problems in the effluent disposal. We finally are firmly against those proposals that are submitted that offer open water discharge in the Calibogue, Port Royal, or the Atlantic. While the effluent may meet all the quality standards, we submit that there are both short-range and long-range problems with this program. I believe Mr. Ellison pointed them out distinctly. Open discharge presents no curb on population growth. It encourages development of all sorts, and should the Sea Pines Public District and Forest Beach District receive an approval, then all PSD's should receive approval on an equal and fair basis.

Issue No. 1

It presents no solution to the non-point pollution problem and doesn't really take in the fact what non-point pollution problems really are, and what that discharge is, and how much of that gets into that drainage pipe that goes into the Calibogue Sound. It has another name, I can't think what it is. It's a drainage pipe.

Issue No. 4

It has a negative effect on the potable water usage. One of our concerns is that the study lacks attention to water reserves, its use, their use, and preservation for the future. With open water discharge as opposed to irrigation, spraying, flooding programs as proposed, other programs that have not really been considered in the study, all the good water is going to go out to the sea. And we'll continue to pump some seventy percent of the water out of our aquafer to irrigate. Why not save that thirty percent that's going to go out to the sea, which is good water, and that's already been proven, to reduce the seventy percent that's going to be pumped up.

We are worried about the water supply, and our most precious resource. And if you all read the Savannah Paper on Sunday, there are serious concerns in the low country, and in the low country of Georgia, between Savannah and Brunswick concerning these faults.

Issue No. 2

The real program again is population growth. And our conclusion is basically that the real population growth plus tourism far exceeds those projected in the study, and far exceeds projected build-out programs. And finally we urge that this study and whatever proposals are finally adopted and implemented are not done too hurriedly. Those who are more expert than we urge at this time,not infinitum, but at least three to five years be given to refine the techniques that are presently being used, and to explore the various proposals and alternative techniques that do exist and are not covered in this study, and be a given time to use these programs.

On one hand we recommend serious programs to eliminate septic tank systems which are high non-point pollution sources, yet forty percent of the Sea Pines are still on septic. What then is the proposal? If we jump into that sort of thing on the capacity of the Sea Pines Public Service District to handle forty percent more waste. Plus the effect on the flooding proposal, Mr. Ellison talked about that. How fast may it be used as a partial solution. Officials urged at least three years to consider and determine the flooding proposal as to how much or how little this technique may be used and whether it will be successful or not. What is the total effect on final irrigation of all golf courses in the Sea Pines Public Service District? What's the effect of adding to that irrigation to private residential use, medium use on 278, which DHEC has refused to allow us to do.

Again the answer is unknown until enough time is taken to analyze the problems and the various variables that are involved. Therefore let us use the study as a tool and a resource to further study and resolve the unknowns that it presents, and to co-ordinate such results in other phases and plans for development, building ordinances, land use plans, population projections, Coastal Council studies and other such as a 208 Study which are to follow. Let's not jump before we know all of the facts, thank you.

HEARING OFFICER: Thank you, Mr. Moorehouse. We appreciate your comments and we'll be responding to those at a later date. This completes the summary of official speakers, as far as their identity is concerned. And now I'd like to go in the order of their registration and call on those people who asked to make a statement at this hearing. The first person that I would like to call at this time is Mr. Manuel Holland, who is minister of the Unitarian Church here at Hilton Head. Mr. Holland, would you like to make a statement? It wasn't clear to me whether you did or not, but as you were one of the first to be registered I wanted to ask you. The next person I would call on is Mr. M. T. Lafitte, and please correct me if I pronounce your name wrong. The next person who has filled out a card and asked to be heard is Leslie Teel. Mr. Teel, I ask you to come forward and speak from the podium so we can get your comments in the record. (Mr. Holland and Mr. Lafitte declined at this time)

COMMENTS BY MR. TEEL:

Mr. Chairman, and ladies and gentlemen, before I forget to say it, I want to say right now that I am now, always have been and always will be one hundred percent in favor of one hundred percent of local financing for sewage disposal. Now I'm at a bit of a disadvantage tonight, because I have not had the opportunity to read the EIS report. Everything that I know about what's been going on I read in the newspaper. Of course, we all know that just once in awhile they might make a little mistake, so you'll have to bear with me.

Now one of the speakers this evening made reference, before I get into that however I'd like to say that in what I have read I have not seen any article that dealt with just who it is that performed the EIS. I'd like to find out, if you don't mind, was this EIS performed by some

State or Federal Agency, or was it performed by a private contractor, because, would you mind enlightening me, please?

HEARING OFFICER: The EIS was done by the Environmental Protection Agency who utilizes a private contractor for the development of these statements. We monitor very closely what the contractor did, and we ask the contractor to do certain items, which he did, and which we reviewed and developed into the report.

Issue No. 6

MR. TEEL: I see, thank you. Now reference has been made tonight to another study that has been made. And I don't know to what, to just what extent this study was made from Clemson University. I'm trying to find the name of the, Cubett, Cubett Engineering. I read an article in yesterday's Island (Phonetic) Packett it was June 22nd, an article, what I read concerning Cubett Engineers really does concern me, especially in light of the fact that some of the people on the EIS and the Environmental Protection Agency of course might take this thing real serious. And if y'all are going to entertain this study, I would certainly hope that along with the other reports you're going to have that maybe you could let us know that this study is being relied on, because I'd like to point out for instance, it said that conclusions jive, that this Cubett's conclusions jive with those of the EIS study team, "That the discharge of three million gallons per day of secondarily treated wastewater would have no effect on the dissolved oxygen or fecal coliform of Calibogue Sound and it's tributaries." Well the first thing that would come to my mind concerning that statement, if it would have no effect at all, then there must not be any of that in the secondarily treated wastewater, and I'm not an expert in that field. And I don't know whether it is or not. But you must conclude that it certainly must be, or why would they mention it? And then as you go on down it says, "They then used the data they collected, March 16th and 18th," this is concerning dye that they put in the water, to study the dye, the ebb and flow of the dye in Calibogue Sound. It said they could use that to develop and calibrate a numerical model of Calibogue Sound," whatever that would be, "To get a prediction of the effects of the sewage outfall. That Cubett Engineering used several complex formulas and technical skills to focus on the effect of dissolved oxygen, coliform and biochemical oxygen demand," and said, "An interesting result is that there is a net flow of approximately ten thousand cubic feet per second through Calibogue Sound and the Port Royal Sound during the spring tide."

Issue No. 6

Well that made me think right off well wonder how many thousands and thousands of cubic feet would be flowing through Cooper River, right down here off of Hilton Head Island, Broad Creek, Jarvis Creek and the May River before it could ever get over to Skull Creek and Mackie Creek to go on over into Port Royal Sound. There's no mention of that at all, but then I found a little article that went on to explain that. They go on down to state, there it is, "Thus any continuously released substance will be transported into Port Royal Sound," And therefore to answer to how many cubic feet are going to all of these other rivers, around where we have our oysters and other shellfish, and shrimp and so forth, the answer to that is according to these people that not any of it is going in there. It's all going over to Calibogue Sound, by some miracle it's going to get over to Calibogue Sound. When they assimilated the water quality with and without the sewage outfall, the results of the two simulations are nearly identical they concluded.

Issue No. 6

I find a bit of a conflict there with what they are saying, because if it's nearly identical, I've already said before that it would have no effect on it at all, on the water quality standard. But down here it says, "It's nearly identical." Well that means it's not identical, and it's a lead pipe cinch it's not going to be a higher water standard if you dump this stuff in there. So what they're saying here is it is going to lower it. That's what South Carolina Wildlife & Game Department has said, even though that was disputed, and they've said it time and again and have never backed down on it, and that's what other agencies have said, the Coastal Council, that the water quality would be reduced if we did it. And I think most of us really and truely know this.

Only by discharging on the ebb tide could the material discharge from the outfall be advected, whatever that is, I've got to look it up, advected predominately to the Atlantic Ocean. Now I imagine in pointing that out it must be something bad about dumping it into the Atlantic Ocean. You can't put it out there, but it's all right to put it in Calibogue and let it go over to Port Royal Sound. I don't understand that reasoning. We don't harvest oysters out in the Atlantic Ocean.

Issue No. 6

It said, "Still the field study and the mathematical model simulation together convinced Cubett Engineering that three million gallons of waste water daily would have "No Effect" on dissolved oxygen or fecal coliform counts in the sound and the tributaries. Well we don't have anybody here tonight from this outfit I imagine to answer a few questions concerning that. But I find that very difficult to believe that it wouldn't have any account in that.

Now I want to drop back on this ten thousand cubic feet per second through Calibogue Sound on spring tide. Spring tide doesn't come but twice a month. And then they go on to say that continuous pumping into it because of this would cause all of it to go in the Port Royal Sound. So I certainly do hope that if you people are going to entertain any of the data that is offered by this study that you will look at it mighty hard and mighty long and ask an awful lot of questions. I mean when they put the dye in there, they said a little bit of it went in the Cooper River and on to Bull Creek to the first bend. That's as far as it's mentioned in this article about the dye. It doesn't say anything about specific gravity or how did it go in there. Did it go in there in a powder or was it a liquid, and if it was what was the specific gravity of that, what was the specific gravity of Calibogue without any of that, and what was the specific gravity of the secondary treated sewage that they want to dump into Calibogue Sound.

Issue No. 6

So there's an awful lot of stuff to be covered with those fellows if you're going to entertain any idea of going along with what they have had to say. Now I'd like to--I wrote down, I just jotted down a little statement right quick like before I came over here. And I think it's important to say this. That it should be pointed out that the subject this evening is of great importance to all of the people in South Carolina in general, and the people of Beaufort County in particular.

Now the article in this paper that I've got here said that they hoped that the people on the Island would come out because they wanted to get their opinion. Well my gracious, there's a lot of people more on this Island involved with this thing, because this estuary system affects all of us. Calibogue Sound is a part of our pristine estuary, which in turn is an important part of our heritage. And it must not be defiled.

I've read observations by.others that ours is the only pristine estuary on the East Coast of the United States. I've sailed in and out of ports in every state from Maine to Florida, and I believe that that is a true statement. I'm skipping over a little bit that I've already gotten to.

I would like to deal with the idea of how much it costs. We've heard a lot about, you know, how this thing is going to cost if we dump it in the Calibogue Sound at 1.8 million and it might be, if you're going to have to dump it over there in Blufton where I live it will be twelve million, something like that. Now that's, I don't believe as far as I'm concerned, and I can't understand any logic whatsoever and what in the heck cost has got to do with it, whether or not you're going to damage the environment. Because that's the bottom line. Are we going to damage the environment? That's what we need to protect irrespective of what the cost is going to be.

And I notice that, unless I overlooked it, I glanced at this report a few minutes ago, that one option was left out, and that's the option of pumping this stuff out to sea.I don't know why they didn't cover that. It looks like that would be a pretty good one to put in there. It would be a lot more logical to pump it out to sea than it would be to try to put it over on the mainland somewhere, because what we've got over there on the mainland is hardpan, and that's not going anywhere but in the May River if you put it over there, the May River on one side and Cooper on the other, you know, we're out on a little peninsula, a good size peninsula.

So I'd like to, in closing, I'd like to make the observation that as far as I can see this problem at hand, that it's not up to the Beaufort County to go over on the mainland and use the imminent domain and so forth that we've heard. I think frankly some of these things sounded very much like a veiled threat to me about imminent domain and how much it's going to cost and how much more people are going to have to pay for a place over here if they can't dump it in Calibogue where it's going to be cheaper.

Well frankly I don't give a damn how much it costs, you know, so long as they don't damage the environment and damage the people, the public interest. We're really dealing with something here that's very important now. We're dealing with the public interest. And if they've got to cut down on the development which I think they should, I was over here one day trying to get to the bank and I almost had a wreck trying to cross the road. They can't even handle the traffic. No wonder they can't handle the sewage. So I think it's time to come to draw the line, say all right, if we can't handle this doggone sewage, then we're just going to have stop bringing all of these people in here and mess up not just Hilton Head, but the whole southern end of Beaufort County and before long, if it goes over there where the engineers say it's going, it's going to be over there in Beaufort. And we're going to have them up in the air. Thank you very much.

HEARING OFFICER: Thank you, Mr. Teel, for some interesting comments. Let me respond very generally to some of the things that you said. First of all, relative to the studies that involve dyes and mathematical models, these are very, very complex engineering studies that, and the results will be interpreted by our engineers and scientists, and will tell us exactly what's happening to the waste that's discharged into Calibogue Sound. And if you'd like to wait until after the hearing, I'll ask one of our staff people here that's been involved in those studies to talk with you a little bit more about it so that you'll understand better what we are doing, and what kind of results we're looking for. But we're looking for a way to, by using dyes that are injected into the sound and tracking it with tidal movements to see how an effluent if it was put out into Calibogue Sound, which way it would go and how it would travel. And using mathematical models we can project what water quality might be. And these are valid studies which we have used for many, many years, and have been very highly perfected by our engineers to give us information on what, you know, what may happen. I agree with you totally, the protection of the environment is our responsibility, and that's our first responsibility, and that's what we've addressed. But what we've done, Mr. Teel, in the EIS is said we can protect the environment with this many different ways, each one of which has a different cost attached to it. And the Federal Law is rather specific in telling us that we must be cost effective in terms of protecting the environment. And that is an obligation we have to the tax payers. And I think you would expect us to, you know, to exercise that responsibility, which we try to do. But you're correct, the first responsibility has to be, you know, for protection of the environment and protection of water quality. And let me say finally that we certainly meant to indicate no veiled threats. The options that were in the EIS were simply some things that could be done. And there are various things that could be done. And we've heard some other things here tonight that could be done. But I appreciate your interest. And we're glad to have you here.

MR. TEEL: I'd like to make a statement. This was not from your agency. The remarks were made, and I'd like to get my paper.

HEARING OFFICER: All right, sir, we'll let you get your paper and I'd like to move on with the next speaker, which is Mr. W. L. Longnecker, who is Chairman of the Island's Concern Commission.

COMMENTS BY MR. LONGNECKER:

Thank you, Mr. Zeller. There may be some repetition as I have heard this evening, but we feel obliged to make this statement. We've found that the wastewater facilities draft very informative, and accept the report as a good comprehensive study of the problem on the Island. We feel however that a decision on the recommended options may be premature at this time. First the report emphasizes that the the non-point source problem is the most serious of the water disposal problems on the Island to the point that Federal funding for any wastewater project is contingent upon the correction of non-source runoff.

Issue No. 1

The Section 208 Study which is currently being prepared is expected to recommend methods to control the non-point source pollution, and must be integrated with the wastewater management recommendations before final decisions should be made. Next, Island wide co-ordination of all the wastewater management programs is recommended. There is no

Issue No. 9

platform yet to accomplish this. It might be possible that considerable monies could be saved and a better overall island management would result.

Third, having heard the proposals of the Sea Pines Public Service District regarding a feasible program to upgrade the wastewater to Lawton Creek from secondary to tertiary water. I think that action justifies a delay to allow measurement of the positive impact on the system. The additional spray irrigation and wetland recharge proposals are important options to consider. The questions are: Which areas can be best benefited by spraying, how much actual usage can golf courses absorb, and how much water can selected areas and wetlands take.

Issue No. 4

If it is feasible to reuse instead of dispose of the water, that is most desirable and the long-range saving of the potable water for future generations is commendable. A delay of action is normally not an acceptable decision. However, in this case it might be advisable to delay a decision for a reasonable period until the related facts are available, until more questions are answered, and until important correlation is completed. Thank you.

HEARING OFFICER: We appreciate your statement. As I indicated we intend to fully evaluate all of the options. The Environmental Impact Statement that we're talking about here tonight is in draft form. And after all of these options have been evaluated a final Impact Statement will be issued. We appreciate your comments. Next I'd like to ask Mr. Charles T. Colson, Jr. Mr. Colson, are you here?

COMMENTS BY MR. COLSON:

I'm Charles O. Colson, Jr., I live on Myrtle Island, which is just outside of Blufton. I live on about two acres of land that have over three hundred foot frontage on the May River. I vitally concerned about the water. I don't care about Hilton Head. These people can have it. I just don't want them messing up my environment. And the way I look at it I could take a pinch of arsenic, put it in a glass of water and drink it, it would kill me. I could put a pinch of arsenic in five gallons of water and drink it, it would probably just make me sick.

Issue No. 5

Now this is what you people want to do. Dump this stuff in Calibogue Sound, and just make me sick instead of killing me. And I don't agree to that. And I think the Coastal Council and I think the Fish & Game Commission is light years ahead of y'all in y'alls thinking.

And Mr. Cooper kept talking about government funds for this. This is the cheapest way we'd get more government money here. Where were you characters when I put in my septic tank? You know, this is foolish. I don't want to pay any money for these people over here to get rid of their sewage. I don't want it in my water. And if it cost them a fortune to get rid of it, that's the price they pay for living there.

And I think it's a terrible situation. And this whole thing to me is just full of politics and money. It smells of sewerage.

HEARING OFFICER: Thank you, Mr. Colson. Mr. Donald Hook.

COMMENTS BY MR. HOOK:

Sir, gentlemen, I would like to report to you tonight the comments and recommendations of the Hilton Head Island Community Association. In this paper which you will receive, there are recountings of history and a bit of data. In each case the reference within the EIS is noted on the paper. In addition to the people, the environment of Hilton Head Island is its most important asset. The climate, the land, the waters and the air all undergird the Island's economic and social base. The high quality of this environment attracts people and their investments in homes, businesses and vacations.

The island will remain a potent attraction so long as it retains a high environmental policy. Our comments and recommendations are keyed to the EIS's objective, which is stated, "To select a wastewater management program for Hilton Head Island that is compatible with the protections of the areas sensitive resources, while recognizing the existing extensive development pressures."

The topics we will address are in order: Protection of the areas resources, expensive development pressures, and a wastewater management program for Hilton Head Island.

Under protection of the areas resources we have chosen to emphasize the functions of planning and monitoring. The importance of planning is illustrated by Sea Pines current problems. Plans for the disposal of the effluent from the Sea Pines two million gallons per day plant could not in 1978 be entirely accomplished. The golf courses could not accept the amount of effluent being produced. To relieve the golf courses about three-quarters of the effluent was discharged into Lawton Canal. Thus the original plan to use only the golf courses was only about twenty-five percent effective. And in addition contributed to contaminating the waters associated with the Lawton Canal.

Continued population growth will call for continued expansion of our sewage treatment systems. If planning for that expansion would be no more effective than the Sea Pines example just sited, our region will be faced with a problem of truely an impressive magnitude as the island and the neighboring mainland approach build-out.

Because planning involves so many complex variables, and because no current comprehensive plan for the island exists, and because unanticipated problems have been experienced here, we suspect that any plan will risk some degree of failure. To minimize that risk we recommend that all governmental agencies charged with protecting the area's resources approve plans for effluent disposal before implementation is permitted.

The function of monitoring provides regulating agencies with information on the state of our island, and indicates the extent to which plans work out in practice. Several monitoring programs are already in effect or are being designed by DHEC, South Carolina Water Resources Commission, the Army Corp of Engineers and the Beaufort Jasper Water Authority.

The EPA states that additional information is required for the effective monitoring of our water quality. We endorse the EPA's recommendation to develop a more extensive water quality base line of the entire island so that that exists against which to measure future water quality changes and assess significance in changes.

We also recommend that data gathered by the various concerned governmental agencies be routinely shared with each other, and with the Beaufort County Joint Planning Commission. In addition to its other uses, the data should be used to help determine island capacities and thus rates and limits for construction and land use in our region.

On the topic of extensive development pressure, much of Hilton Head Island's development compliments the high quality of nature's work. Our man-made environment, including homes and accommodations for transients and sports facilities help to make Hilton Head Island a desirable place to visit and to live. However, largely because of information presented in the Joint Planning Commission's State of the Island Report earlier this year, the community has become acutely aware of the extent to which development can degrade the quality of living here. Of the burdens that we people put upon the land and the waters.

There is deep concern that the Island's capacities will become irreversibly overburdened. The extensive development pressures noted in the EIS's Statement of Purpose must not be allowed to force a decision in the selecting of a wastewater management systems. Those very pressures help to generate Sea Pines present dilemma and created a problem in the Lawton Waters, the solution of which will probably require residents of Sea Pines and Forest Beach to pay increased costs for no increase in services.

The interest of Hilton Head Island's residents and visitors will be poorly served indeed if the Island's capacities for safe disposal are exceeded and if users must pay for mistakes not of their own making. To help protect the interests of the Island's residents, visitors and tourist industry, one, we support the EPA's recommendations for the development of better controls and the more astringent enforcement of existing regulations as detailed in the EIS under Mitigative Measures.

Two, we recommend that any plan for correcting existing problems or those which arise in the future, and which will require additional financing or operating costs be cost effective for current users. That is either no additional charge should be made, or the additional costs should beyond correcting the problem result in some other positive benefit to the community. This speaks to Mr. Ellison's re-use.

Our final segment is on a wastewater management plan for Hilton Head Island. The Hilton Head Island Community Association supported and continues to support South Carolina Coastal Council's proposal that no discharge of effluent to the surface waters around Hilton Head Island be permitted. One concern about this method of effluent disposal is that the precedent thereby established at any location would make surface water discharge a readily available option for all other locations as noted in the EIS.

This could happen even if poor results were obtained in the initial case on the grounds that water quality would not be lowered since it would have been already polluted. The second concern stems from the mobility of effluent in tides and currents. Should unexpected pollution or other undesirable conditions occur, nearby areas could be very easily affected.

Hilton Head Island itself could be boomeranged by its own effluent, or by others' effluent similarly discharge Thirdly, we note the sharp disagreement of other agencies to the EPA over the acceptability of discharging effluent to our surface waters.

When different agencies, each charged with protecting the public interest and the environment reach such radically different conclusions, we think it prudent to recommend against implementing a plan.

The next page, which I will not read, details some quotations from letters in response to the South Carolina Coastal Sound.

Disposal of effluent on land at a rate and by methods consistent with the absorbative capacity of a disposal site is far preferable to discharge the surface waters. However, we believe that Hilton Head Island's problems should be solved on Hilton Head Island. It is patently unfair to pre-empt the use of off-island land from those who may later require the use of that land. We agree with the point of view for instance that Blufton should not become our septic tank.

We recommend that a site or sites on Hilton Head Island be acquired for effluent disposal, or that other methods and technologies be explored. Among these could be, already mentioned this evening, irrigation of roadsides, medians and/or private property, recyling of purified water through the potable water supply, aquifers and/or storage tanks, and anaerobic generators.

Issue No. 9

The summary recommendation speaks to the fact that we are geographically an entity. Socially we are an entity, if not politically. We think that all plans for the Island should recognize that fact. Therefore, we recommend that an island-wide plan for sewage treatment and disposal should be created and implemented. Such a plan would help avoid problems arising from piecemeal, unco-ordinated development of sewage systems on the Island, would facilitate a maintenance of standards, and would aid the cause of orderly development.

The plan should include, A, development of an extensive water quality baseline for the entire Island as recommended by the EIS. B, the certainment of the capacities for effluent absorption for all areas of the Island. This information could help to determine advisable rates in extensive development.

C, it should include the development of better con-

Issue No. 4

trols and/or more astringent enforcement of existing regulations as recommended by the EIS. And lastly, encouragement to the extent possible of water conservation techniques by public and private water users, again as recommended by the EIS.

Issue No. 1

We recognize that non-point source pollution is indeed a major problem. And we recommend vigorous pursuit of regulation and correction of non-point source pollution. This would include continued development of techniques, as well as development of regulation and enforcement procedures. Thank you.

HEARING OFFICER: Thank you, that was a very good statement. I appreciate your comments, and we'll be looking forward to receiving that. And as I've indicated other speakers will respond to that. I think you have rather accurately identified the problems that we've really been talking about all night long. Now we're talking about two different things. We're talking about protection of environment, and we're talking about people. And those are not necessarily the same issue, and each one has to be addressed in its own right. And if we're going to talk about protecting the environment, we're going to have to consider people and the plans that are made as far as people are concerned in terms of land use and the types of developments that we have on this island. And we cannot necessarily control how people live and whether the island grows through development of our environmental program.

I think it's extremely important that we look at and consider that we're not dealing with one single option here in terms of resolving the problem on Hilton Head. There are many options. It depends on how we choose to react to our people problem of what we want to do. You can't, you know, we don't want to get ourselves locked into a vacuum and consider there's one solution to this problem. That's not true. We have to look at both of the issues, and that's very, very critical. And that's why we're here, and why we're listening to comments. The solution to one is not necessarily the solution to the other. And it may not turn out that way. Thank you very much. I think you correctly addressed that problem.

Next let me ask for Bea Cheil, and I know I didn't pronounce that right. You're going to have to correct me on that. The secretary of the League of Women Voters, we're very glad to have you here tonight. The League of Women Voters is one of my favorite organizations. I'm looking forward to hearing your comments.

COMMENTS BY MS. CHEIL:

Thank you, my name is Beatrice Cheil. And I am speaking I am making a statement for the Hilton Head Island Members at Large Unit of the League of Women Voters. The League has studied the final draft of the Environmental Impact Analysis Statement for Hilton Head Island Wastewater Facilities, dated February, 1982. It is our valued judgement that none of the alternatives listed in this document is completely satisfactory as a solution to the problems associated with wastewater management on the Island. The League commends those agencies involved in this document for their deligent and comprehensive study thus far, but urges them to continue to seeking more satisfactory solutions.

Issue No. 4

The League fully agrees with DHEC, that effluent must be treated. Our recommendation is for tertiary treatment to potable form and recycling. We are against the discharge of treated sewage into the waters around Hilton Head Island which may be harmful not only to Island residents, but also to neighboring communities. There must be some assurance that any proposal to discharge wastewater downstream does not result in the Domino Effect where the last property owner suffers.

No alteration of existing waterways, lagoons, ponds, rivers, streams, et cetera, should be allowed unless a change would increase the filtering of the non-point run-off, and not adversely affect the natural drainage systems or existing water flow.

The League urges support for policies to reduce the non-essential part of waste streams and the recovery of the non-reduceable portion so as to insure safe disposal of the rest. This would preclude dumping in the areas where shellfish harvesting and recreational fishing would be severely affected and would result in loss of income to many native islanders.

The section in the draft on the mitigative measures makes it clear that there must be co-operation from Beaufort County. Such measures as reduction of impervious surfaces of parking areas, on-site retention or percolation of run-off, the use of wetlands for purification of storm water runoff, not overloading wetlands which may harm natural vegetation, and encouraging erosion and setimentation control on sites adjacent to bodies of water are the areas in which local government must act in order to lessen the impact of population growth on the environment. The League study of the Environmental Impact Statement raises the question, which we ask of you respectfully. Has the EPA ever considered the possibility and the feasibility of consolidation of all public service districts and independent waste and sewage companies on Hilton Head Island as an alternative. If not, then may we suggest such a study which may reveal that the financial burden on any one segment to the Island may be lessened, also that golf courses which do not have available treated effluent to meet

Issue No. 10

Issue No. 10

their irrigation needs at this time may benefit from excess treated effluent of other areas. The mechanics of exercising condemnation authority for land acquisition may be simplified. Duplication of facilities and services may be eliminated. And the problems of Hilton Head Island wastewater disposal could be taken care of on the Island where it originates.

At this time it appears that even the experts cannot agree. Therefore the League cannot presume to have the final solution. We ask only that there be further study to seek the alternative which would assure waters that are safe to swim in, habitable for aquatic life, free of nuisance conditions, and usable for commercial and recreational fishing.

This we see is imperative for the health, the safety and the economy of Hilton Head Island. Thank you.

HEARING OFFICER: Thank you very much, we appreciate your being here and taking the time to develop those comments. Next I'd like to ask Carol Daly with the May River Committee to come forward, please.

COMMENTS BY MR. DALY:

Issue No. 5

Carol Daly from the May River Committee, which was formed because we are a group living around the river, and we're concerned about of course the discharge of sewage into Calibogue. We have tried to do work to be intelligent so that we know what we're talking about, and I'm not--I'm going to be very brief, because if you will write to the May River Committee, we will give you our fact sheets and then on any item on there that you want more knowledge about, you write to the May River Committee in Blufton, you don't need to put a box on it, and we will get you detailed answers for that.

I wish we could support, we're for what EPA is for, the same as the Coastal Council and all of you, but in no way can we support the EIS Statement. It is loosely reasoned. It is, there are too many woulds and shoulds, might be and could be. And we're never going to get anywhere with that. We have to say shall, cannot, and use words like that.

I didn't want to talk about the Cubett Engineering Study because I haven't seen it. I know that Arnold will send me one. But I haven't. But there are some great concerns I have about it of which I've expressed to Arnold a month or two ago that of all the days to do the tests, and really what they're after is dispersion of the effluent. They did it on March the 18th with the lowest current in the whole year, 1.19 (Unintelligible).

Issue No. 6

Tonight for example, it's 2.7, I just looked it up in the table just for the heck of it. And on a good spring tide it's 3.3 knots. The 3.3 knots would have lots

Issue No. 5

more dispersion. And why it was made on a flood night I don't know because the basic way to discharge and disperse effluent is on an ebb tide with intermittent discharge. Intermittent discharge is a small word but it means a lot to holding areas for the effluent and hold it there four or five days. It's quite expensive and quite involved. I haven't seen any note that EPA has taken that into account, and the cost factor. But the cost factor does not interest me because when I look at Cubbidge on the May River unloading twenty-eight bushels of crabs in one day and realize how many others are out there, and when I think where those crabs are going, this is a little ridiculous to say, but I don't think it is, they're going up to Baltimore.

Now Chesapeake Bay is suffering badly. The crabs are really in, well say bad shape. And maybe most of the biologists feel that the Susquehannah River is bringing down what we're talking about, and which I've heard described tonight like you could drink it, but it isn't. There are standards of what the effluent secondarily treated contains, and I won't go into that.

We know who live up in the marshes that it is a giant nursery. As a matter of fact the Port Royal Sound study which really, any of you who are interested should get it, because it's understandable even for laymen like myself in the beginning, in their summaries. They call it a national treasure, these marshes from Beaufort on down to where we are. And they truely are. If you ever cast a shrimp net and saw the little one inch flounders and stripe bass, why you just can't believe what's there.

We care about it. We're really concerned and we do not feel the EPA has given us any attention, our marsh, we do not think so. I have heard, I think, a hundred times about the Lawton Canal, the effluent coming from the service district being purer than the Lawton Canal. I'll tell you something, and this is no secret to anyone, any embayment, which is the May River, there's no fresh water in it, it's not even an estuary, you can't call it that. It accumulates all the impurities, not all of them, but it accumulates and builds, and builds and builds, because it doesn't flush with fresh water. Now this isn't, if you want facts on it, I'll give you those.

I was hoping that everything would be wrapped up. We've spent so much time with working with the (Phonetic) SAMP Plan which we like to do it. It was great experience, and made us feel good. So because our committee has started on this 208, now to other people in other areas we're about ten years behind on treating the surface wasterwater, because they are now looking to see how much is coming from the sky. We use to not think about things like that. And this might be trite. We know you need to collect like the first inch or half inch, and then you can let the rest go, because you've got the one with all the impurities.

There is so much to be done, but I'll assure you, we're not going to get any place unless we make positive statements that this is. And it's just like the best things that happen for all of us is to forget discharging into Calibogue, do you know why? It will make you do something. Lots of communities, and I could name them, declare a moratorium. It's terrible, builders and everybody, it's terrible. But some--I think it has to, I don't, I'm not telling you what to do on Hilton Head. Our interest really, we're off-islanders, is on the island.

The May River Committee would be so glad to work positively. We have the facilities available to do it. But I'm sorry, we cannot support your Environmental Impact Statement. And we do have the great big one, too. Thank you.

HEARING OFFICER: We appreciate your comments, Mr. Daly. And if you will provide us the information you indicated you have, we would be interested in reviewing it. And we'll respond to it. Next let me call on Palmer Simmons. Bob Bender, who is assistant editor of the Hilton Head News. Mr. Joel Meeker?

MR. MEEKER: I have nothing to add, sir, thank you.

HEARING OFFICER: Mr. Robert Albright? Wheatley, Carrie or Garrie Wheatley. Perry White, president of the Hilton Head Chapter of the N.A.A.C.P.

COMMENTS BY MR. WHITE: Mr. Zeller, we would like to comment the team and the study for tying the EIS to the 208 non-point source study. After all, we feel that the non-point source is a part of the problem and simply a product of development that created the wastewater problems in the first place.

Issue No. 1

Our concerns about the study are many. However, I will confine my comments to a few points, and others will be addressed in a letter directly to EPA.

First, we are diabolically opposed to any and all options and recommendations that call for the dumping of treated wastewater in the canals, the creeks, sounds, the ocean, or any other body of salt water on the island, or surrounding the island.

Our second concern deals with property outside of the populate, outside of the plantations, and other known planned developments. Mention is made of these areas as it relates to the build-out population for the island. We question how the need for sewage capacity was determined. A further question is what will happen in the event these areas were to be developed at a density similar to those of other sections of the island.

Issue No. 9

Issue No. 12

A third area of concern is the fishing industry. One section of the study referred to it as part of black culture. We believe that statement to be an understatement as well as an incorrect one. The loss of this important natural resource must have a far greater impact on the food service industry of this island than on the few people who earn their livelihood by harvesting and prossessing of seafoods.

The allusion to the industry as a black culture further points to a lack of understanding of the native islanders by the study group and other new-comers to the island. Many people have fought diligently to keep polluting industries from coming into our area. Why then should we permit the so-called clean industries to pollute the waters.

A fourth concern deals with the treatment of marinas, and pollution from boats. We consider your treatment to be too light for the level and the type of pollution generated from those sources. We have some questions. What effect, if any will consolidation of all public service districts have with the discharge of wastewater and associated problems? Why did the study only list privately, only list privately owned sewage treatment plants and avoided their problems. What do they do with wastewater? There are some observations.

Issue No. 10

First, it is apparent from the study that the availability of Federal funds is the only big stick that the EPA has. If so, what happens when funding is obtained from other sources? Is it okay for privately funded sewage treatment plants to discharge in our waters?

The second observation, the Sea Pines Company celebrated its twenty-fifth anniversary this week. It is the oldest and the premiere developer on this island. The company is known for its high quality development. If a company of this caliber finds it necessary to dump its wastewater in our creeks, what is to be expected of developers with lesser reputations.

If development on this island has caused these problems in twenty-five short years, what can be expected in the next twenty-five years? What price will future generations have to pay for our mistakes and for our grief? Thank you.

HEARING OFFICER: Thank you, Mr. White, for a very good statement. You raised some points that we will be responding to in the final analysis. I would make one comment to you. We'll respond fully to all of the issues, but you mentioned that the Federal dollars appeared to be the only big stick involved in this program. That's not totally true, because there are, there are other, if you will, big sticks that can be utilized through permit programs and other requirements that can be exercised. So dollars are not the only answer. No matter what dollars are utilized in development of waste treatment facilities, those facilities must meet water quality requirements and adequately protect the environment. Thank you for your comments. Next let me ask Bob Gale, who is chairman of the Nancy Cathcart Group of the Siera Club.

COMMENTS BY MR. GALE:

Issue No. 5

I speak for the South Carolina State Siera Club Chapter, as well as the local group. The Nancy Cathcart Group of the South Carolina Siera Club strongly opposes the strategy that the discharge of treated effluent should be allowed into the surface waters, such as Calibogue Sound off of Hilton Head. Our position is that no discharge of treated effluent to the surface waters around Hilton Head Island should be permitted.

Issue No. 4

Treated water is a resource and should be used on Hilton Head Island, not dumped off the island. Land application using natural infiltration techniques in wetlands, golf courses and sports fields should be employed where feasible. The surface waters around Hilton Head Island are generally pristine estuarine environments.

Issue No. 5

We must not set the precedent that inland waters such as Calibogue Sound make useful dumps for sewage or any other material. Dumping chlorinated water in the sound could have these adverse biological effects, one, useful algae, the base of the marshland food chain could be killed.

Two, useful bacteria in bottom sediments could be killed. Three, the larval stage of growth in oysters, crabs and fin-fish could be adversely affected, thereby pyramiding a deficit impact throughout the estuarine food web.

Large outfalls of treated wastewater would change the serenity at the dump site. Five, entire populations of wildlife at the dump site could be altered. Chlorine, even at low levels has been found to be toxic to animals. New treatment technology, such as treatment of effluent with ultra-violet light should be employed, if possible.

Secondarily treated sewage contains nutrients that could overload sediments with nitrogen and phosphorus. If there are low currents at the sub-surface levels of inland waters, this overloading could impact the aerobic anaerobic balance of decomposition of bottom matter.

We urge EPA to investigate these effects and how well inland waters can flush pollutants using long-term research, based on firm biological and hydrological data. Our estuaries are critical habitats too vital to all living things here to be impacted by a short sighted easy way out solution to an effluent problem which may very well have innovative, useful solutions.

Issue No. 9

The solution for disposing treated effluent should include the entire island, not just one public service district. Wastewater should be recycled island-wide. Public

Issue No. 4

service districts should develop tertiary treatment plants which further purify wastewater and remove nitrogen and phosphorus. Drinking water can be produced by tertiary treatment. This would provide a guaranteed drinking water supply, and would conserve our dwindling ground water reserves. Certainly recylcing drinking water from tertiary treatment would be a wiser investment than pumping water from the Savannah River, which could be further impacted by future industrial pollution.

Wastewater can be returned to our aquatic marshes and swamps. Hereeffluent is filtered by plant life and absorbed by the spongy soil of the watershed. This process is called natural infiltration. Other areas which could benefit the limited irrigation of wastewater are golf courses, lawns, sports fields, power easements, and highway median plannings.

The Siera Club urges the EPA to reject dumping effluent into surface waters of Hilton Head Island, and to focus on more creative solutions to waste disposal problems, which would involve sound biological principals and water conservation techniques.

That concludes my statement, but I would like to further add that the Island Community should support the Sea Pines Public Service District for considering the many alternatives that they have been looking into all along, and particularly the tertiary treatment of effluent for reuse. And we also think that DHEC is to be commended for its, as I understand it it has considered allowing tertiary effluent to be used for irrigating medians and highway shrubbery plannings. We support any research along those lines. Thank you.

HEARING OFFICER: Thank you very much, Mr. Gale. I might make a brief comment. We share your concern with regard to the use of chlorine. I think there has been a great many well documented scientific studies that have shown that in certain areas this can be harmful to the environment. And as you indicated other methods such as ultra-violet are available for disinfection and we agree with you very strongly on that subject, and any effort made in this regard would probably include UV. It will certainly be a strong factor in our consideration. Next let me ask Mr. Thomas Barnwell. Mr. Barnwell is a shrimp fisherman.

COMMENTS BY MR. BARNWELL:

I'm not sure I can say I appreciate that, because there are many of us here who feel that this effort of potentially dumping the water into Port Royal Sound and Calibogue Sound would definitely be a major detriment to the shrimp-fishing and the seafood industry, not just of Hilton Head, but Beaufort County area. And we're very much opposed to that. I would like to just mention some numbers for your records.

And these numbers are reflected in the 1979 South Carolina statistical report that's accumulated by the South Carolina Commercial Seafood Producers, as well as they're found within the Statistical Bureau of DHEC. For example we begin looking at only one year isolation, just whole fish caught for the entire State in terms of dollar volume for '79 was $2,643,457.00; point eighty percent of that fish harvest came from the Beaufort County Community.

Oysters in terms of dollar volume, 1979 statewide was $1,279,802.00. Eighty-three percent of those oysters' dollars was generated in Beaufort County. Crabs, whole, in terms of dollar volume for the entire State was $1,986,403.00, sixty-eight percent of those were produced in Beaufort County. Clams, in the shell, total value for the State was 463,882, and of course Beaufort County produced thirteen percent of that, and the volume is climbing. Shrimp production, $20,059,406.00 worth statewide. Of that thirty-three percent was produced in Beaufort County.

Of the numbers that I have thrown out to you comes up to a total dollar volume, $26,455,690.00. And of course, you isolate the shrimp from that you get thirty-five percent in terms of the dollars in the seafood industry you can find in the Beaufort County Community alone.

I would like to echo extreme appreciation to Mr. Perry White for his statements, and I'd like for the record to echo that very, very plain, it's a concern of ours as fishermen within the area. I'd like also to make note of the League of Women Voters' comments about saving the waters clean, not just for us alone, as persons in the industry providing a safe food for the entire country, not just Hilton Head Island. And we certainly hope that those of you who have a voice in the decision making process posture into this decision that you will allow the seafood producers of this area to continue to be an economically viable entity in this community. Thank you.

HEARING OFFICER: Thank you, very much, Mr. Barnwell. You have certainly demonstrated to us the importance of Beaufort County in the State's landings and as far as value is concerned those were some very significant numbers. Next let me ask Mr. Emory Campbell, N.A.A.C.P.

COMMENTS BY MR. CAMPBELL:

Mr. Chairman, my comment has to do with drainage. We believe that is was stated much too lightly in the EIS. At one time on the island the drainage system encompassed the entire island. In this study you've treated it as a mitigating measure too lightly, we feel. We feel that the original ditches that have been allowed to be closed are now non-functional, and therefore we have many more portions of wetlands that are really authentic on the island. The new drainage systems that have been developed over the last twenty-five years only deal with those developed areas, and therefore other areas have been allowed to become wetlands that are not actually wetlands. Yet we know drainage is important. And we would not want all of the ditches opened up to flow into the rivers without any kind of filtering.

We think that you should address the drainage system to be designed to drain through or to the swamps and old historic wetlands. Now we know that the 208 Study is considering this, but an important study such as this should also address it much more heavily than it has.

We note that also the draining, I mean ditches draining to wetlands now might cause some other problems, but we think wherever feasible those ditches should be reopened and drained to those wetlands. And in order to find them again, we urge you to consult with some old islanders who know where they all are, so that you might find them and include them in your study. Thank you.

HEARING OFFICER: Thank you, Mr. Campbell, that brings up an interesting point, and one that we were talking about tonight as we left for dinner. As we looked at Hilton Head and talked about many of the things that have happened on the island in the last twenty-five years, as the island was developed where certain areas were killed and certain drainage patterns were changed, and a great many human manidepending a lot on how things work out.

The final EIS, when it does come out, will have a summary of the draft, and it will have all of the comments that were brought out in light at this hearing, and EPA's response to those comments. Now we'll have a summary of the new information, and we'll have a final decision from EPA. Now there has been some new information that's been brought out at this hearing, and we'll respond to that information. It will be in the final impact statement. I want to remind all of you again that I asked you to fill out a card at the beginning of this hearing so you could receive EPA's final decision. If you've done so, you will. If you haven't, you may wish to fill out that card, so that you'll receive that information.

Again I thank you for your presence, and I saw a hand in the audience, do you have an additional comment you'd like to make? If so I'd ask you to come to the podium so that I can get it on the record.

NOTE: (Mr. Morris Campbell was mentioned as being present.)

HEARING OFFICER: We're happy to have you, Mr. Campbell. We are pleased that you would come to our hearing. Again, if there are no other comments to be made at this time I'm going to declare this hearing closed, and thank you for your attention.

END OF HEARING.

C E R T I F I C A T E

I hereby certify that the foregoing eighty-five pages of typrwritten material were taken down and transcribed under my supervision, and that the same contain a true and correct transcript of said proceeding.

I further certify that I am a disinterested party to this action, and that I am not of kin nor counsel to any of the parties hereto.

This 29th day of June, 1982.

CERBONE & RUCHALSKI

By: Edmund W. Ruchalski
EDMUND W. RUCHALSKI
Certified Court Reporter B-538
Notary Public

EDMUND W. RUCHALSKI
Notary Public, Chatham County,
My Commission Expires Nov. 21, [illegible]

LISTING OF WRITTEN COMMENTS

Copies of written comments regarding the Hilton Head Draft EIS which were received relative to the June 23, 1982 public hearing follow. A listing of all written comments is provided below.

COMMENTER	REPRESENTING	DATE
Roger E. Davis	South Carolina DHEC	July 9, 1982
James H. Lee	U. S. Department of the Interior - Office of Environmental Project Review	June 29, 1982
Donald P. Schrader	C and S Investments South	July 8, 1982
N. A. Lieurance	Broad Creek Public Service District	July 8, 1982
Christopher W. Billman	Sierra Club, South Carolina Chapter	July 12, 1982
Charles Gatch	Beaufort County Joint Planning Commission	July 7, 1982
Charles Golson	Citizen	July 7, 1982
Melville Coburn	Hilton Head No. 1 Public Service District	July 6, 1982
Colonel Dominy	Department of the Army Savannah District Corps of Engineers	July 7, 1982
H. Wayne Beam	South Carolina Coastal Council	June 17, 1982
A. P. Crouse, Jr.	Department of the Army Charleston District Corps of Engineers	May 14, 1982
Capt. J. M. Giarnese	Department of the Air Force	May 12, 1982
M. T. Laffitte	Citizen	July 6, 1982
L. P. Struble, Jr.	Citizen	July 1, 1982
Carroll Dailey	May River Committee	June 28, 1982
E. J. Kusel	Association of Sea Pines Plantation Property Owners, Inc.	June 28, 1982

COMMENTER	REPRESENTING	DATE
J. Stephen Hopkins	South Carolina Wildlife & Marine Resources Department	June 24, 1982
Dr. F. S. Lisella	U. S. Public Health Service	June 25, 1982
Nancy Ciehanski	League of Women Voters, Hilton Head Island Members-At-Large Unit	June 23, 1982
---	The Hilton Head Island Community Association, Inc.	June 23, 1982
W. L. Longnecker	Association of Sea Pines Plantation Property Owners, Island Concerns Committee	June 23, 1982
---	Hilton Head Island Commission	---
---	Sea Pines Public Service District	---
W. T. Hunter	Broad Creek Public Service District	June 14, 1982

South Carolina
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2600 Bull Street
Columbia, S.C. 29201

July 9, 1982

Mr. E. T. Heinen
Chief, Environmental Assessment Branch
Environmental Protection Agency--Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365

Re: Draft Environmental Impact Statement
Hilton Head, South Carolina

Dear Mr. Heinen:

The S. C. Department of Health and Environmental Control has reviewed the referenced document and the comments on the enclosure were generated as a result. As you may know, this agency has been involved with this project from the outset and has generated a significant amount of information which was utilized in the effort. Additionally, I have enclosed a copy of the statement I read into the record at the public hearing.

We appreciate the opportunity to provide this input, and will be available at your convenience to discuss or clarify our comments.

Sincerely,

Roger C. Davis

Roger E. Davis, P.E.
Assistant Deputy Commissioner
Environmental Quality Control

Attachments.

ENVIRONMENTAL ASSESSMENT BRANCH
RECEIVED
JUL 22 1982
EPA - REGION IV

SC DHEC COMMENTS

Draft Environmental Impact Statement
Hilton Head Island

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1. Page iii: SC DHEC established the position in discussions of Sea Pines Public Service District consent order that priority should be given to alternatives which eliminate any discharge to Lawton Canal. This position is consistent with recommendations made to the District as early as 1970. Therefore, we agree that the utilization of treated effluent for irrigation and wetlands recharge should be included as a part of the selected alternatives.

Issue No.1

2. Page xiii - xiv: We agree that Federal funding should be conditional upon the development of an implementable plan to address the non-point source (NPS) pollution. If this problem is not dealt with, no added beneficial use of the waters, presently closed for shellfishing, will be possible.

Issue No. 2

3. Page II - 2: While the population projections for funding purposes have apparently been accepted by all parties, we are convinced that the actual population will be much higher. Therefore, either the off-island irrigation alternative or a discharge alternative may ultimately be required unless growth controls are implemented at the local level of government.

4. Page II - 10 and II - 11: The use of sand mounds in areas similar to the island has not been very successful.

5. Page II - 13: Flow and waste-reduction measures should be more seriously recommended. EPA should consider funding an educational/retrofit program for the Sea Pines/Forest Beach areas.

6. Page II - 39: Hilton Head No. PSD may encounter difficulty in gaining approval of the Federal Aviation Administration to irrigate the airport property. The City of Aiken recently had a similar proposal rejected because of the potential for attracting birds.

7. Page III - 21: Long-range planning for water supply should include consideration of an off-island source.

8. Page IV - 6: The mitigative measure for the primary impact of irrigation on groundwater quality should be expanded to describe how application rates could be lessened. If it is necessary to hold land in reserve for this purpose, the cost should be included for the irrigation alternatives.

9. Page IV - 7: The statement that "a more active water quality role by DHEC is required" is not clear. This should be clarified, or examples listed. (We assume this refers to more water quality studies.)

10. "Technical Reference Document A, Environmental Inventory Task Report" should be updated to include Amendment #2 to DHEC Consent Order 78-84-W, which limits the allowable discharge to Lawton Canal to 1.8 mgd.

Obviously, each of the alternatives for wastewater management in this document has certain negative impacts. Recognizing that the major responsibility of DHEC is the protection of the environment and public health, the Agency believes that Alternative B (Calibogue Sound discharge) is the alternative which best addresses the overall problems associated with ultimate waste disposal. In addition, this alternative is cost effective, an important fact in view of the large cost differential of the two least cost alternatives. *Issue No. 5*

Alternative D (island irrigation) could impact groundwater quality and the non-point source pollution problem. Additionally, this alternative will very likely not provide for ultimate development. While Alternative E (off-island irrigation) could overcome the limitation on growth imposed by Alternative D, if cost is not a factor, long-term leases could be difficult to obtain, in view of the local opposition.

Alternative B is predicted to have minimal, possibly immeasurable, impact on Calibogue Sound and surrounding waters, provided a well-designed and well-placed outfall is constructed. Disinfection of the effluent will likely be unnecessary, which will overcome one of the major concerns expressed for this alternative. The maximum utilization of effluent for irrigation, consistent with site limitations should continue to be required, as proposed. *Issue No. 5*

In consideration of the environmental impact and cost effectiveness criteria, the Calibogue Sound alternative is strongly favored by DHEC.

RED/cds

HILTON HEAD EIS

Statement for the Hearing Record
June 23, 1982

Roger E. Davis

The staff of the SC Department of Health and Environmental Control has been involved with this Environmental Impact Statement since its inception, having generated some of the information contained therein and having reviewed the work of others.

It has become obvious, through this process, that there is no ideal solution to the problems created by the population density of this barrier island. Hilton Head is surrounded by high quality waters, despite the degree of habitation that currently exists. However, violations of water quality standards exist, because the water must be of nearly pristine quality for the harvesting of shellfish to be allowed. Studies have shown that rainwater which flows across the island, collected in storm drains, and discharged to the lagoons and creeks is sufficiently contaminated to be the major cause of the elevated bacteria levels in those areas which have been closed for shellfishing. Unless this problem, which is known as nonpoint pollution, is solved--funds directed at upgrading of waste treatment plants will provide no added beneficial use of the surrounding waters. *Issue No. 1*

A "two-pronged" approach to the point and nonpoint sources of pollution will require a high degree of local coordination and action. Strong local ordinances must be developed for the island as a whole for any nonpoint source control program to be effective. Strong consideration should also be given to water conservation measures, both as a means of protecting a limited supply of groundwater and of reducing the magnitude of the waste disposal problem. The installation of water-efficient fixtures in new construction can still have a measurable impact, given the buildout yet expected to occur. *Issue No. 4*

The Department has been concerned about the impact of the point source discharged from the early days of development of the island. The first indication of this concern was in 1967, when the proposed facility to discharge to the Lawton Canal area was judged adequate to protect the shellfish beds at the projected wasteflows, then projected at 500,000 gpd. In 1970, the Department began encouraging the District to use spray irrigation as a means of waste disposal, and received positive responses.

I would like to take this opportunity to clear up what seems to be a recurring misconception. Reference has been made numerous times to the "unpermitted discharge" of Sea Pines Public Service District, in the context of its being an illegal discharge. This characterization is inappropriate, since the facility was constructed with full DHEC approval. We chose not to issue a Federal discharge permit for the facility on the basis of the District's plan to phase out the discharge. Unfortunately, the plan to totally eliminate the discharge was unsuccessful. DHEC, then, issued an administrative order which recognized and authorized the continued discharge to Lawton Ditch, and required the study of additional alternatives to the discharge. This study has been supplanted by this EIS.

The study of the water quality issues on the island has been a high priority for DHEC. For two straight years, the Hilton Head EIS was identified by DHEC as one of only a few major issues included in a coordination agreement between the agency and EPA.

After evaluating comments received here tonight, DHEC will submit detailed comments on the draft EIS before the close of the record.

Thank you.

United States Department of the Interior
OFFICE OF ENVIRONMENTAL PROJECT REVIEW
Southeast Region / Suite 1384
Richard B. Russell Federal Building
75 Spring Street, S.W. / Atlanta, Ga. 30303

June 29, 1982

ER-82/813

Mr. E. T. Heinen, Chief
Environmental Assessment Branch
EPA, Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365

Dear Mr. Heinen:

We have reviewed the draft environmental statement, Wastewater Facilities, Hilton Head, Beaufort County, South Carolina, and have the following comments.

General Comments

The draft Environmental Impact Statement (EIS) addresses alternatives for and impacts of wastewater management facilities on Hilton Head Island, South Carolina. Hilton Head is a large barrier island mostly devoted to resort development. Wastewater collection and treatment for the island is principally provided by four public service districts.

Issue No. 8

With minor exceptions, mainly regarding endangered and threatened species, we find that the statement adequately addresses impacts on fish and wildlife resources. Several endangered or threatened species may occur in or adjacent to the proposed project area. To facilitate compliance with Section 7(c) of the Endangered Species Act (Act) of 1973, as amended, Federal agencies or designated non-Federal representatives are required to obtain from the Fish and Wildlife Service (FWS) information concerning the possible presence of any species, listed or proposed to be listed, which may be present in the impact area of a proposed construction project, defined as a major Federal action significantly affecting the quality of the human environment. This information was furnished on request to Claude Terry and Associates, Inc., by letter of January 7, 1981.

Section 7(c) and related regulations also require the Federal agency or the designated non-Federal representative proposing a major Federal action to conduct and submit to the FWS a biological assessment to determine the effects of the proposal on listed and proposed endangered and threatened species. The biological assessment shall be completed within 180 days after the date on which initiated or within a time frame mutually agreed upon between the agency and the FWS and before initiating the proposed action. If the biological assessment has not begun within 90 days, your agency must verify informally (via telephone) to the FWS that the list of species obtained for the project area is still accurate. We do not feel that we can adequately assess the effects of the proposed action on listed and proposed endangered and threatened species or critical habitat without a complete assessment. To date, FWS has not received the biological assessment and the EIS does not address impacts on endangered and threatened species. Therefore, EPA's obligation under the Act remains unfulfilled. Correspondence regarding endangered and threatened species should reference log number 4-2-81-054 and be addressed to Area Manager, Fish and Wildlife Service, Plateau Building, Room A-5, 50 South French Broad Avenue, Asheville, North Carolina 28801.

The Bureau of Mines has no objection to the construction of the small wastewater treatment facilities as proposed. These facilities will have little impact on the availability of the heavy mineral resources present on Hilton Head Island.

Extensive drilling programs conducted by the Bureau of Mines in 1954 and National Lead Company in 1955 delineated heavy mineral deposits on Hilton Head Island. These are described in Bulletins 26 and 35 of the South Carolina Division of Geology. Recent aeroradioactivity studies conducted by the U.S. Geological Survey give additional information about the location of deposits. The final EIS should mention the presence of these minerals. If the construction of the wastewater treatment facilities is believed to have no impact on heavy mineral resources, a statement to that effect should be included in the final EIS.

Specific Comments

Chapter II, D3 (pages 11-14) - This section should be more specific regarding the applicability of development constraints contained in the recently passed South Carolina Coastal Council (SCCC) Hilton Head Island Special Area Management Plan (SAMP) to the project.

Chapter II, D4 (pages 11-15) - Since under the proposed alternative, no Federal funds would be provided for wastewater disposal unless non-point source control measures are implemented, the third paragraph of this section should be expanded to read: "Recommendations from this program (208) regarding the control of non-point source pollution must be integrated with the wastewater management programs on the island in order to upgrade and preserve the quality of area waters and in order to qualify for Federal Wastewater management funding."

Chapter III, B4 (page III-5) - In discussing impacts to aquatic systems, the potential impacts related to the precedent setting nature of the subaqueous outfall to Calibogue Sound should be addressed.

Chapter III, C (page III-10) and C1, (page III-16) - FWS has concerns with the philosophy that wastewater disposal alternatives involving surface discharges would be the lesser constraint to development. The text in these sections implies that it would only be a matter of increasing plant capacity, pumping capability and NPDES permit limitations to expand treatment facilities. Since the assimilative capacity of waters is finite, public trust dictates that the referenced statements should be tempered with emphasis on the limitations as shown in Table II-2. Also, the additional NPDES permits for increased discharges would need further analysis to prevent excessive waste loadings.

Summary Comments

In light of the recognized adverse impacts of stormwater runoff to the surface water quality around Hilton Head Island, we are in total concurrence with the preferred wastewater management alternative for the Sea Pines PSD-Forest Beach PSD of Federal funding conditional or an effective non-point source program being developed and implemerted for the Sea Pines PSD-Forest Beach PSD area and endangered species responsibilities being fulfilled. Within these constraints, the document has identified three environmentally acceptable disposal options for the Sea Pines PSD-Forest Beach PSD. These options are discharge to Calibogue Sound, spray irrigation on-island and off-island, and selection of the most cost-effective, implementable alternative.

Cost estimates within the document show the discharge of secondarily treated effluent into Calibogue Sound as being the least costly of the three alternatives. However, it is very difficult to assign a dollar cost to utilization of the finite assimilative capacity of public waters or the potential long term degradation of water quality arising from the cumulative impact due to the precedent this alternative would set.

Implementability of the Calibogue Sound alternative is highly questionable. Since writing of the draft EIS, the SCCC has passed a SAMP for Hilton Head Island. Due to concerns regarding the precedent-setting nature of this discharge, and possible and probable environmental effects to marine resources, the SAMP has adopted the policy of "No discharge of primary or secondary treated effluent into the critical areas of Hilton Head Island . . . ." Since a permit, or at least certification, would be required through the SCCC for this discharge, it is unlikely that the Calibogue Sound discharge alternative is implementable. This development should be addressed in the final EIS, and EPA recommendations adjusted accordingly.

We are extremely interested in the Sea Pines PSD controlled experimental program for the Forest Preserve wetland discharge plan referred to in the draft EIS. Specific study plans for monitoring the effectiveness, impacts and practical limits related to use of this proposed wetlands discharge system would be worthwhile to explore in the final EIS.

Thank you for the opportunity to comment on the draft enviromental impact statement.

Sincerely,

James H. Lee

James H. Lee
Regional Environmental Officer

POPE GREENWOOD COMPLEX

C and S INVESTMENTS SOUTH
P.O.Box 4978 · Hilton Head Island, S.C. 29928 · (803)785·7501

July 8, 1982

Mr. Howard Zeller
Assistant Regional Administrator
EPA, Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Mr. Zeller:

I have studied the Draft E.I.S. Study Volume 1 dated December 1981, and the E.I.S. Draft dated May 1982. As a researcher for 30 years, I compliment you on design, organization, methods and presentation.

My area of residence and property ownership is in the Sea Pines Public Service District. It is only regarding that area that I feel qualified to speak. Your presentation combined with the statement of Arnold Ellison of the Sea Pines Public Service District seem to offer a clear solution:' Ellison to pursue all the methods he outlines and finally tertiary treatment to a Calibogue Sound outfall as a backup position.

Issue No. 3

May I submit these thoughts for your consideration:

Stormwater Runoff

This is a serious problem to all of us but it is not a sewage problem. Every developer should be required to hold at least the first inch of run-off on site and then provide for adequate elimination of excess. Already developed areas should be asked to re-examine their situation and be required where possible to create holding areas if current ones are inadequate.

But again this is not a sewage problem. As I understand, we are trying to solve the problem of the SPPSD serving the people it was empowered to serve.

Restraint of Growth

Frequently throughout your drafts, you refer to steps that would increase island growth as though that were a negative. We have a County Council, a Joint Planning Commission and an Island Council who have responsibility for orderly development of the island. An attempt to restrict growth through denying sewer seems most inappropriate.

Opposition

More than 13,000 people live on Hilton Head Island. Approximately 100 attended the June 23 public hearing, and maybe a dozen spoke. Most of the speakers from these special interest groups were against Calibogue Sound outfall, but I am sure you heard no substantial scientific reason to support these emotional positions. It was simply a matter of, "it doesn't sound good to me."

You should not get the impression from those who spoke against your recommendations that the island population is overwhelmingly negative. You could just as well conclude that of 13,000 permanent residents, only a dozen question the report.

You are receiving a letter from the Beaufort County Joint Planning Commission objecting to treated waste water being released into surface water, but as the Council's dissenting vice--president said at the meeting, "the county had no basis in fact for its opposition."

The newly formed Island Commission is also negative to the E.I.S. recommendations, but being unable to object on scientific basis, sees sewer restriction as a growth control.

Hardship

It is the responsibility of the Sea Pines Public Service District to supply water and sewage services so property owners can enjoy their property. This we are being denied. Since 1978 our partnership has owned 54 acres of undeveloped land between the Forest Preserve and Sea Pines Circle. The limited allotment of sewer in August 1981 permitted us to develop a small shopping center on nine acres and an office building on four acres. We also gave four acres to the Audobon Society. We can do nothing further. Lack of sewer is denying us the use of our 36 acres. This causes a severe economic hardship.

Summary

- After lengthy, exhaustive study you have determined that non-point source is more severe than point source pollution.

- You have determined that proper discharge to Calibogue Sound is environmentally acceptable.

- Arnold Ellison has plans that would minimize the Sound outfall and improve the quality of effluent.

- There has been no scientific opposition to your recommendations.

- Additional sewage acceptance by the Sea Pines Public Service District is urgently needed.

- Your draft decisions and recommendations should become your final report.

Sincerely,

Donald P. Schrader

BROAD CREEK PUBLIC SERVICE DISTRICT
POST OFFICE BOX 5628
HILTON HEAD ISLAND, S. C. 29928

July 8, 1982

Mr. E. T. Heinen, Chief
Environmental Assessment Branch
Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Hilton Head Island, South Carolina Environmental Impact Statement
Your File No.EPA 904/9-81-091

Dear Mr. Heinen:

The purpose of this letter is to provide additional written comments during the comment period per your notice dated April 30, 1982, open until July 9, 1982. We would like to have this comment be made a part of the hearing record.

First of all, we wish to specifically enumerate the past letters and pieces of correspondence which should be a part of the record in this file. These are listed as follows:

1. Letter from Mr. William T. Hunter dated June 14, 1982;
2. Letter from Mr. William T. Hunter dated August 20, 1981;
3. Letter from Mr. Lonnie E. Dye of Hussey, Gay & Bell on behalf of the Broad Creek Public Service District dated June 16, 1981 and attachments.

Reference is made to your Plate I-1 entitled Wastewater Facilities and Disposal areas. We wish to note for the record that while the location of the wastewater facility of the Broad Creek Public Service District is correct, the disposal area is incorrect as it relates to the area immediately surrounding the wastewater facility. That area is not inside the District's boundaries pursuant to its enabling legislation adopted in 1972. There is an approximate 60 acre "out parcel".

Second, reference is made to Table III-4. To the best of our belief, the appropriate plantation dwelling units at build-out for the following two areas within the District are:

Shelter Cove:

Single-family -0- ; multi-family 1613hotel 240; commercial; 300,000 square feet

Palmetto Dunes:

Single-family 1328; multi-family 3,500; hotel 1164;

Paragraph Plate III-3 entitled "Plantation Lands and Generalized Heirs Property, we note also possesses the same potential problem with respect to the point mentioned above. The out parcel surrounding the sewage treatment plant approximately 60 acres, is not a part of the District nor is it part of Palmetto Dunes Resort. Accordingly, it might be more appropriate to have that area "shaded" as is not part of the Plantation lands. It would be considered part of "generalized heirs property".

Issue No. 2

Fourth, the District wishes to go on record and state that the maximum size of the sewage treatment plant is presently estimated to be 2.4 mpg; however, this size of the facility will be reviewed by the District on an ongoing basis as development takes place. In addition, the method of disposal of treated wastewater will also be subject to a continual method of review on behalf of the District. Our position is that the South Carolina Department of Health and Environmental Control should give consideration and approval to expansion plans for the wastewater treatment facility irrespective of the information contained in the Environmental Impact Statement.

Very truly yours,

N A Lieurance

N. A. Lieurance, Chairman
Broad Creek Public Service District
Commission

cc: BCPSD Commissioners
Cary Griffin
Gus Bell

SIERRA CLUB South Carolina Chapter

. . . To explore, enjoy and preserve the nation's forests, waters, wildlife and wilderness . . .

July 12

E. T. Heinen, Chief
Environmental Assessment Branch
EPA, Region IV
345 Courtland Street, N. E.
Atlanta, Georgia 30365

Dear Sir:

Enclosed please find our statement regarding the Environmental Impact Study for Hilton Head Island wastewater facilities.

We realize that your deadline for comments was July 9; however, we hope that our tardiness will not prevent you from reading and considering our comments.

We thank you for your time and attention.

Sincerely,

Christopher W. Billman

Christopher W. Billman
Chairman, Conservation Committee

enc.

ENVIRONMENTAL ASSESSMENT BRANCH
JUL 15 1982
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COMMENTS ON HILTON HEAD ISLAND E. I. S. BY NANCY CATHCART GROUP OF THE S. C. SIERRA CLUB CHAPTER

The Nancy Cathcart Group of the S. C. Sierra Club Chapter strongly opposes the strategy that the discharge of treated effluent should be allowed into the surface waters (Calibogue Sound) off Hilton Head. Our position is that NO discharge of treated effluent to the surface waters around Hilton Head Island should be permitted.

Issue No. 4

Treated water is a resource and should be used on Hilton Head Island, not dumped off island. Land application -- using natural infiltration techniques in wetlands, golf course and sports fields -- should be employed where feasible.

The surface waters around Hilton Head Island are generally pristine estuarine environments. We must not set the precedent that inland waters (such as Calibogue Sound) make useful dumps for sewage or any other material.

Secondarily treated sewage contains nutrients that could overload sediments with nitrogen and phosphorous. If there are low currents at subsurface levels of inland waters, this overloading could impact the aerobic-anaerobic balance of decomposition of bottom matter.

We urge E. P. A. to investigate these effects and how well inland waters can flush pollutants using long term research based on firm biological and hydrological data. Our estuaries are critical habitats too vital to all living things here to be impacted by a short-sighted, easy-way-out solution to an effluent problem which may very well have innovative, useful solutions.

Issue No. 9

The solution for disposing treated effluent should include the entire island, not just one public service district. Wastewater should be recycled island-wide. Public service districts should develop tertiary treatment plants which further purify wastewater and remove nitrogen and phosphorous. Drinking water can be produced by tertiary treatment. This would provide a guaranteed drinking water supply and would conserve our dwindling ground water reserves. Certainly, recycling drinking water from tertiary treatment would be a wiser investment than pumping water from the Savannah River, which could be further impacted by future industrial pollution.

Wastewater can be returned to our aquatic marshes and swamps. Here effluent is filtered by plantlife and absorbed by the spongy soil of the watershed. This process is called "Natural Infiltration". Other areas which could benefit from limited irrigation of wastewater are golf courses, lawns, sports fields, power easements and highway median plantings.

The Sierra Club urges E. P. A. to reject dumping effluent into the surface waters of Hilton Head Island and to focus on more creative solutions to waste disposal problems which would involve sound biologic principles and conservation techniques.

JPC

July 7, 1982

Mr. E. T. Heinen, Chief
Environmental Assessment Branch
EPA, Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Mr. Heinen:

The Beaufort County Joint Planning Commission has reviewed the Hilton Head Island Draft EIS and has adopted the following recommendations regarding issues discussed in the study as part of the Hilton Head Island Land Use Plan.

1. Although the EPA study of 1981 found acceptable the disposal of treated effluent into surface waters, no treated effluent should be discharged into the surface waters around Hilton Head Island until an Island-wide assessment of the environmental impacts and water quality is made and a monitoring system is designed.

Issue No. 9

Issue No. 10

2. Beaufort County should pursue a comprehensive Island-wide approach to waste water treatment and effluent disposal and consider merging the Public Service Districts or establishing another public agency that serves the needs of the entire Island.

In their discussions of these recommendations, the Commissioners voiced strong support for the position taken by the South Carolina Council in the recently adopted Special Area Management Plan for HIlton Head Island.

Regarding other matters discussed in the EIS, the following issues were identified and recommendations made.

Shallow groundwater and surface water quality samples taken as part of the Department of Health and Environmental Control's study in Sea Pines identified water quality problems during dry weather conditions. Their study indicated that the shallow groundwater table may possibly be polluted and seepage into Lawton and other creeks in the Sea Pines area is contributing to continuous water quality problems. These problems should not be related to non-point runoff problems created during wet weather.

eufort County Joint Planning Commission/P.O. Drawer 1228/Beaufort, S.C. 29902/803-524-4444, Ext.

Issue No. 11

3. A long-term program of frequent shallow watertable monitoring in areas relying upon septic tank systems should be undertaken by the Beaufort County Health Department and Department of Health and Environmental Control.

Issue No. 12

4. In areas served by central collection and treatment systems, no new septic tank systems should be allowed or old systems replaced.

5. The long-term goal should be removal of all septic tank systems from the Island as central treatment systems become available.

With kindest regards,

Charles Gatch (emg)

Charles Gatch
Executive Director

CG/jl

ENVIRONMENTAL ASSESSMENT BRANCH
RECEIVED
JUL 13 1982
163
EPA-

Charles O. Golson, Jr.
P.O. Box 457
Myrtle Island
Bluffton, S.C. 29910

July 7, 1982

United States Environmental Protection Agency
345 Courtland
Atlanta, Ga. 30365

Re: Hilton Head EIS Statement

Gentlemen:

I hope you took note of the fact that at the public hearing of the EIS, not the first developer from Hilton Head addressed the meeting. I feel that the developers have the EPA locked up in their hip pocket and did not wish to attend the meeting and rock the boat.

It is more than obvious that you people have lost sight of the word ENVIRONMENT in your name and should make immediate arrangements to change it to the Developers Protective Association of Hilton Head.

The marshlands are the bread basket of the food chain of marine life. Your proposal of dumping into the sound can only have a detrimental effect. You certainly cannot show a plus. The South Carolina Coastal COUNCIL understands this much better than you people.

On the subject of federal aid to assist dumping into the sound, do you know that Sea Pines, as well as the other plantations, are PRIVATE. There is a guard at every enterance and the public is turned away. If the sewerage outfall into the sound comes to past, it could make an interesting court case.

I have never had much confidence in any government bureaucracy and your EIS certainly bears this out. This time you put the money down the sewer instead of the usual rat hole.

It has been about 120 years since the last Yankee invasion and at that time Sherman laid waste from the mountains to the sea. We now have a Yankee invasion of Hilton Head and the developers with your aid will lay waste to the ecology of this area.

Very truly yours,

Charles O. Golson, Jr.

HILTON HEAD NO. 1 PUBLIC SERVICE DISTRICT
Industrial Park Road — Post Office Box 1264
Hilton Head Island, South Carolina 29925
Telephone 803 - 785-5525

July 6, 1982

To: E. T. Heinen, Environmental Assessment Branch

From: Hilton Head Number One Public Service District

Re: Draft EIS for Hilton Head Island, South Carolina

1. The Commissioners of the Hilton Head Number One Public Service District (District) offer the following comments on the Draft EIS for Hilton Head Island, as it relates to future planning and development within the District:

   A. General
   The draft EIS does not adequately "...address the provision of wastewater management facilities to serve existing and future needs", as stated in the purpose of the EIS on page I-1 , paragraph 1.

   B. Population Projection

   Issue No. 2

   There is a large disparity between the OBERS population projection and the actual population. This disparity impinges on the demand for wastewater flows. In the District's case, actual flows have already exceeded the OBERS projected flows for the year 2000. In addition, the criteria used for the OBERS, as well as the JPC population projection should have been presented in a separate appendix in order that their differences may be evaluated, and that any assumptions used in the projection could be compared to the growth actually occuring on the Island. In this way, the original projection could be updated to a more accurate figure.

   C. "No Action" Alternative

   Issue No. 9

   The decision to present the "no action" alternative for areas whose present population and/or wastewater flows have already exceeded the OBERS projection is not consistant with the stated purpose of the EIS. While these "no action" areas are no longer eligible for federal funding, this should not preclude a discussion of the available alternatives for wastewater management in order that a comprehensive assessment may be established for the Island and be available to all Districts for their future planning needs. As the EIS is now written, it is primarily applicable to the Sea Pines Public Service District and is not of value to the Island as a whole. It should be noted that in Title 40; part 1500, (Preparation of Environmental Impact Statements: Guidelines, established by the Council on Environmental Quality), Section 1500.5 (Types of actions covered by the Act), paragraph 2 states that " 'actions' include but are not limited to: new and continuing projects and program activities... supported in whole or in part through federal contracts, grants, ...". The District is presently being funded by the EPA for construction of new wastewater facilities; therefore, while the District is no longer elibible, it is using federal funds and should not be included in the "no action" alternative.

2. In conclusion, the District feels that the Draft Environmental Impact Statement for Hilton Head Island does not adequately describe the existing environmental conditions, nor does it fulfill it's stated purpose. Therefore, the District recommends that the responsible agency re-evaluate the criteria used to develop the EIS; re-evaluate their assesment of existing conditions; and re-evaluate their recommendation based upon it's effect on the future planning and development of Hilton Head Island as a total community.

Respectfully submitted,

Melville B. Coburn

Melville B. Coburn
Chairman

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 889
SAVANNAH, GEORGIA 31402

REPLY TO
ATTENTION OF:

SASPD-EI

7 JUL 1982

Mr. E. T. Heinen
Chief, Environmental Assessment Branch
Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Heinen:

Reference is made to your Notice of Public Hearing dated 30 April 1982 and the Draft EIS on Hilton Head, South Carolina Wastewater Facilities, which was forwarded to my office by the U. S. Army Corps of Engineers, Washington, D. C.

My comments are attached as Inclosure 1. I would appreciate the opportunity to comment on any further actions concerning the project.

Sincerely,

for
CHARLES E. DOMINY
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

Copy Furnished:
USACE (DAEN-CWP-V) WASH DC 20314

COMMENTS ON HILTON HEAD WASTEWATER DEIS

Issue No. 7

Cultural Resources. Locating the sites through survey would not be adequate mitigation. The EPA needs to indicate that they will comply with current legislation and regulations to avoid or mitigate impacts to significant cultural resources.

Regulatory Functions. Construction of the alternative treatment facilities and discharge structures will likely require Department of the Army authorizations. Hilton Head Island lies within the regulatory jurisdiction of the Charleston District; review for regulatory purposes requires coordination with SACOP-P. However, the scope and detail of a DEIS for a 201 facilities plan is not amenable to determination of regulatory requirements.

RECEIVED JUL 1 5 1982

South Carolina Coastal Council

James M. Waddell, Jr.
Chairman

H. Wayne Beam, Ph.D
Executive Director

June 17, 1982

Mr. Charles Jeter
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Environmental Impact Statement for
Hilton Head Island, S.C. Wastewater
Facilities

Dear Charlie:

The South Carolina Coastal Council has completed its review of the Draft Environmental Impact Statement for Hilton Head Island, S.C. Wastewater Facilities. Pursuant to the policies of the South Carolina Coastal Zone Management Plan and 15 CFR Part 930: Consistency for Department of the Interior Outer Continental Shelf Prelease Sale Activities and for Other Federal Activities Directly Affecting the Coastal Zone, an alternative method allowing the discharge of secondarily treated effluent into Calibogue Sound is not consistent with the policies of the South Carolina Coastal Council. The Hilton Head Island Special Area Management Plan (Chapter Two, Section I, Item C) states that "no discharge of primary or secondarily treated effluent into the critical areas of Hilton Head Island" shall be allowed.

Whereas we do recognize that the EIS, as issued on April 30, 1982, is still in draft form, please be advised of the Coastal Council's concern and intentions. Should the final EIS contain this alternative in a design which would not satisfy our consistency requirements, the Coastal Council would be obliged to submit a negative determination at the appropriate time.

We realize the difficulties associated with providing the necessary infrastructure to support development, however, the Coastal Council's responsibilities as mandated by the South Carolina General Assembly, remain directed toward the preservation and enhancement of a sound natural environment for future generations. We appreciate your deliberations, and look forward to working with you to bring about an acceptable solution.

Sincerely,

H. Wayne Beam

H. Wayne Beam
Executive Director

HWB:jmk
cc: Senator James M. Waddell, Jr.
Mr. Duncan C. Newkirk

erall Center, 19 Hagood Street Suite 802 • Charleston, South Carolina 29403 • (803) 792-5808

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
P O BOX 919
CHARLESTON SC 29402

REPLY TO
ATTENTION OF
SACEN-E

14 May 1982

Mr. E. T. Heinen, Chief
Environmental Assessment Branch
EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Heinen:

Issue No. 7

We have reviewed the draft EIS for waste-water facilities at Hilton Head, South Carolina and have no comments in connection with environmental considerations. However, it appears that a Department of the Army permit will be required for some of the proposed alternatives.

Should you have any questions concerning Department of the Army permits, please telephone Mr. A. B. Gould at (803) 724-4610.

Sincerely,

Arthur P. Crouse

ARTHUR P. CROUSE, JR.
Chief, Engineering Division

Copy furnished:
Office, Chief of Engineers
ATTN: DAEN-CWP-V
WASH DC 20314

Division Engineer, South Atlantic
ATTN: SADPD-R

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE AIR FORCE
REGIONAL CIVIL ENGINEER, EASTERN REGION (HQ AFESC)
526 TITLE BUILDING, 30 PRYOR STREET, S.W.
ATLANTA, GEORGIA 30303

REPLY TO ATTN OF: ROV2

12 May 1982

SUBJECT: Draft Environmental Impact Statement (DEIS), Hilton Head, South Carolina Wastewater Facilities

TO: U. S. Environmental Protection Agency
Region IV
Attn: Mr. E. T. Heinen
Chief, Environmental Assessment Branch
345 Courtland Street, N. E.
Atlanta, Georgia 30365

1. As the Air Force central point of contact for intergovernmental coordination of environmental planning matters in Federal Regions I - IV, we have reviewed the subject DEIS and find that development of the proposed project will have no impact on Air Force operations in South Carolina.

2. Thank you for the opportunity to review this DEIS. Our point of contact is Mr. Winfred G. Dodson, FTS: 242-6821/6776.

JOHN M. GIARNESE
Captain, USAF, Deputy Chief
Environmental Planning Division

ECOLOGICAL [illegible] BRANCH
RECEIVED
MAY 13
EPA-REGION IV
ATLANTA, GA.

MONTAGUE TUCKER LAFFITTE
MYRTLE ISLAND
POST OFFICE BOX 461
BLUFFTON, SOUTH CAROLINA 29910

July 6, 1982

Mr. E. T. Heinan
Chief, Environmental Assessment Branch
US Environmental Protection Agency, Region 1V
345 Courtland Street
Atlanta, Georgia 30365

Dear Mr. Heinan:

re: Hilton Head Island
Environmental Impact
Statement

Issue No. 5

I live on the May River in Bluffton and am vitally interested in the protection of its waters. I am in favor of S. C. Coastal Council's Plan which states that there will be no discharge of treated effluent into Calibogue Sound and against your recommendation of pumping treated effluent into Calibogue Sound.

Issue No. 6

Also, I think that the Cubit Engineering study of Calibogue Sound was a misrepresentation of facts. They used only 50 pounds of dye and it was released on the flood tide on March 18, 1982, which date, according to NOAA current charts, had the least tidal flow of the year. On that day, the tide flow was only 1.1 knots, compared to an average flow of 2.2 knots.

I urge you to reconsider your Draft and recommend that no discharge of treated effluent be allowed in Calibogue Sound.

Yours truly,

Montague T. Laffitte

Montague T. Laffitte

MTL/kcb

L. P. STRUBLE JR.
3 KILLDEER LANE
HILTON HEAD ISLAND, S. C.
29928

July 1, 1982

E. T. Heinan
Chief - Enviornmental Assessment Branch
U. S. Enviornmental Protection Agency
Region IV
345 Courtland Street
Atlanta, Georgia 30365

Dear Sir:

I wish to enter this statement in regard to the EIS discussed at the Hilton Head Island Elementary School on June 23, 1982.

I moved to Hilton Head Island in 1978 and one of the chief reasons for coming here was to fully enjoy and exploit the marine life in the waters around the Island.

In the winter I gather oysters for my own consumption at the Public Oyster Grounds. During the rest of the year I fish off-shore, in-shore and in the bays and sounds. Already these activities have been threatened by pollution.

Issue No. 5

Partially treated effluent makes the consumption of shell fish unhealthy and dangerous. If the effluent is treated to the extent that it does not cause pollution of shell fish, it will have so much chlorine and other chemicals in it that all marine life will be endangered. Food and breeding grounds for sea life will be ruined and eventually we will have little or no marine life in our waters.

I further object to discharge in our waters because there can be no careful control on the quality of the effluent. Mechcanical breakdown, human carelessness or outright violation of the laws can go along unnoticed until the area waters have been seriously polluted.

If any further permits are made for proper sewage treatment, I think they should be reserved for effluent from sewers that will replace the septic tanks on the Island. If any capacity remains, after consideration of normal home growth, the balance of capacity may be assigned to multiple housing or commercial units.

Thank you.

Very truly yours,

L. P. Struble Jr.

May River Committee
Preserve Our Estuary
Box 391, Bluffton, S.C. 29910 757-3470 and 757-3248

June 28, 1982

E.T.Heinen, Chief
EPA Region IV
Atlanta, Ga

Re: Hilton Head Island
Environmental Impact
Statement

Dear Mr. Heinen:

Issue No. 5

Our committee cannot support EPA's recommendation as to discharging effluent into Calibogue Sound. You have not provided data to support your conclusion.

Attached is our fact sheet in more detail than the one we sent you in February. This new fact sheet elaborates on but does not supercede our previous letter.

Our Committee will be ready by Fall to work with you on the complex challenge of dealing with the '208' program.

Carroll O. Dailey
for May River Committee

May River Committee
Preserve Our Estuary
Box 391, Bluffton, S.C. 29910 757-3470 and 757-3248

DATA SHEET - RE. EFFLUENT DISCHARGE INTO CALIBOGUE SOUND

The May River is merely an arm of the Sound (embayment). As such no fresh water flushes it and thus it becomes a trap for accumulating flotsam, nutrients, viral pathogens, chlorine and whatever might be introduced to its waters. Attention has not been by EPA in its E.I.S. draft to this potential for pollution.

Issue No. 6

DYE STUDY

We are aware Sea Pines Public Service District has made a study through a professional engineering firm to determine dispersion data on effluent discharge. Since we have not seen the report, our information is incomplete, being based on newspaper reports. We have misgivings about this study for reasons stated below.

Dye tests were made on Mar. 18, 1982, when, according to NOAA current charts, the current was least for the entire year.

It is generally accepted that discharge must be intermittant to coordinate with the ebb tide current. The tests were made on a 1.1 knot flood tide. (Port Royal Sound Study of 1972 released dye on the ebb tide in the Colleton River in an amount of 750 lbs with approximately one fifth the volume of Braddock Point where 50 lbs were used.)

May River Committee

Preserve Our Estuary

Box 391, Bluffton, S.C. 29910   757-3470 and 757-3248

CURRENT INFORMATION

Maximum Currents during 1982 at Braddock Point
32° 07.1'N 80° 50'W

Spring Flood	3.2 knots	Spring Ebb	3.3 knots
Neap "	1.1 "	Neap "	1.9 "
Average Flood	2.2 "	Aver. "	2.5 "

Currents for Three Dates in 1982

June 23 Flood	2.7 knots	Ebb	3.3 knots
Mar 18 "	1.1 "	"	1.8 "
April 8 "	2.4 "	"	2.7 "

Generalized Information on Current Patterns

A spring flood tide entering Calibogue from the south meets the flood tide coming down from Port Royal at the May River mouth. The western side of this current from the south continues without interruption into the May River. On the easterly side of the Sound there is great turmoil where the two flood tides meet at May River entrance. With its much larger volume the tide from south rides over the small current and continues to Port Royal Sound where it turns immediately along the north shore of the Island eastward and then southerly along the coast.

Other Miscellaneous Data

References have been made about releasing the effluent in deep water as a means of dispersion. There is no water deep enough in Calibogue for such dispersion (50'-60') since the effluent immediately rises to the surface when released into saltwater.

ASPPPO

Association of Sea Pines Plantation Property Owners, Inc.

Post Office Box 5704
Hilton Head Island, S.C. 29938
Telephone 785-7721

ERMS EXPIRE
bruary 1983
avid M. Bachelder
bert G. Bellows
. Richard Cathcart
n J. Grant
lark L. Stuppy

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June 28, 1982

Mr. E. T. Heinan
Chief, Environmental Assessment Branch
U.S. Environmental Protection Agency, Region IV
345 Courtland St.
Atlanta, GA 30365

Subject: Environmental Impact Statement
covering Hilton Head Island

Good morning, Mr. Heinan:

Issue No. 3

The Board of Directors of the Association of Sea Pines Plantation Property Owners Association, Inc. urges the granting of an extension to the Sea Pines Public Service District for discharge of excess treated effluent into the Lawton Canal. This extension should be for a reasonable period of time not to exceed five (5) years. Furthermore, the effluent must be given tertiary treatment and the Sea Pines PSD must seek out additional on island land areas for spray irrigation including privately owned landscaped areas, road medians, etc.

This extension will give the various agencies involved the necessary time to determine the most cost effective method of disposing of this excess discharge in the future. As of this date, these agencies are not in agreement indicating there are still many questions to be answered. Certainly they must await the completion of the 208 study since storm water run off is the major pollutant to be dealt with in a total plan for Hilton Head Island.

If the tertiary treated effluent can be used for other purposes such as spray irrigation of privately owned landscaped areas and road medians which now use our drinking water, we will conserve significant amounts of potable water for use by future generations.

Thank you for your consideration.

Cordially,

EJ Kusel

E.J. Kusel
President

EJK/mm

Suite 10, Elguin Building — 41 Bow Circle — Palmetto Bay Center

South Carolina
Wildlife & Marine
Resources Department

James A. Timmerman, Jr., Ph.D
Executive Director
Pat Ryan
Director of
Law Enforcement and Boating

J. Stephen Hopkins
Marine Resources Division
SCWMRD
P.O. Box 478
Port Royal, S.C. 29935

24 June 1982

Mr. E.T. Heinan
Chief, Environmental Assessment Branch
US Environmental Protection Agency, Region IV
345 Courtland St.
Atlanta, GA 30365

Dear Mr. Heinan, *Issue No. 5*

The Marine Resources Division of the S.C. Wildlife and Marine Resources Dept. would like to issue a few comments concerning the Draft Environmental Impact Statement for Hilton Head Island Wastewater Facilities. Our position, with regards to the disposal of wastewater, has not changed since the inception of this study in May 1979. However, the preferred alternative outlined in the draft does not meet with our approval so we find it necessary to reiterate our objection to the disposal of wastewater in the marine environment. This objection is based upon the adverse impacts of a number of pollutants which one would expect to find associated with the Sea Pines - Forest Beach PSD effluent as well as the deleterious precedent it would set for other coastal developments. These pollutants include, but are not limited to, excessive levels of nutrients, disinfecting agents, viruses, heavy metals, pesticides, BOD and fresh water.

As mentioned in previous letters to EPA concerning this same situation, it is feared that the nutrient load in the effluent from the Sea Pines waste treatment facility, as well as future outfalls from new developments, could have adverse impacts on the marine food chain. It has been established that the species composition of the phytoplankton community is sensitive to changes in the level of various nutrients as well as the ratio of nitrogen:phosphate. For instance, nutrient overloading and low N:P ratios tend to favor such species as Nanochloris sp. and Stichoccus sp. These algae are consumed by the American Oyster but are an inferior nutrient source. Thus, oyster production is decreased. A decrease in oyster production will impact upon the recreational and commercial oyster fisheries as well as the physical characteristics of the estuary. Oyster reefs play an essential role in the formation of tide pools which are highly utilized by a variety of organisms. In addition, oysters influence the water turbidity by depositing suspended particulate matter (100 lbs. of sediment

P.O. Box 167 ☐ Dutch Plaza ☐ Building D ☐ Columbia, South Carolina 29202 ☐ Telephone: 803-758-6736

per year per square yard of reef).

Dense blooms of algae, resulting from nutrient overloading, will also affect the biological oxygen demand. In some instances, the BOD is intense enough to result in an oxygen depletion, killing a variety of marine organisms and lowering total production.

The changes in the ecosystem mentioned above, while serious in themselves, are overshadowed by a yet more damaging agent. Research conducted over the past few years has shown that the addition of large quantities of chlorine to the marine environment is extremely damaging. The best example is the Chesapeake Bay where the cumulative effect of a large number of treated sewage outfalls is believed by some to be the primary agent responsible for the declining fishery resources in what has historically been the largest seafood producing area in the country. The problem in that area is perceived to be so serious that the Tidewater Administration of the state of Maryland may back a bill in that legislature to ban all chlorinated discharges to surface waters. The toxic affects of chlorine has been demonstrated for a large number of marine organisms, many of which exist in Calibogue Sound and it's tributaries. A few examples of organisms to which chlorine is toxic are the Rockfish or striped bass (*Morone saxatilis*), Spotted Seatrout (*Cynoscion nebulosus*), Spot (*Leiostomus xanthurus*), Atlantic Siversides (*Menidia mendia*), Blue Crabs (*Callinectes sapidus*), Mud Crabs (*Panopeus herbstii*), Hermit Crabs (*Pagurus longicarpus*), Hard Clams (*Mercenaria mercenaria*), American Oysters (*Crassostrea virginica*), and lower down the food chain, a copepod (*Acartia tonsa*).

Several fish kills in Maryland have been attributed to chlorine toxicity. In addition, a 1977 report to the U.S. Congress by the Comptroller General encouraged EPA to stop unnecessary and harmful levels of domestic sewage chlorination. The idea of chlorinating a marine outfall to prevent bacterial contamination of shellfish is self-defeating. As the volume of the discharge increases in response to continued development you approach a situation where the shellfish are safe to eat, if you can find any that are still alive. In addition, disinfecting agents are not completely effective in destroying certain viruses which may become concentrated in filter feeders.

Another adverse impact of wastewater discharges is the toxic affects of trace metals and their geochemical deriviatives. Trace metal contamination is often thought of as being associated with industrial discharges. However, it has been found that trace metals are present in fairly high concentrations in municipal wastewater discharges as well. When freshwater polluted with "dissolved" trace metals enter the marine system, the metals and their derivatives are rapidly deposited in the sediment through floculation and precipitation of colloids. The toxicity of these compounds varies from species to species. Some organisms are killed outright through absorption or ingestion. Other benthic animals and algae accumulate the pollutants and pass them on to organisms higher up the food chain. In this way, the trace metals may be distributed throughout the estuarine system and later passed on to man at locations far removed from the actual discharge pipe.

Inevitably, pesticides also make their way into municipal wastewater discharges. The adverse effects of pesticides upon marine life is well documented and its pathways are often similar to that of certain trace metals as discussed above.

Even the fresh water which is released via a marine discharge can have an adverse effect on the systems total productivity. The salinity gradients around Hilton Head are already being impacted by the increase in runoff as a result of land use changes. An additional five million gallons per day just stresses the system that much more. As salinities change, stenohaline species are displaced and the species diversity dwindles. It is just one more way in which man disrupts an ecosystem which has evolved to make the best use of the natural conditions. Even if the toxic effects of many components of the discharge are overlooked, the abrupt (in an evolutionary sense) changes resulting from water quality manipulation will result in long term productivity reductions while the system is shifting towards a new equilibrium.

We agree with statements in the draft EIS which note that non-point source pollution is of a greater magnitude than the point source discharge. However, we do not agree with assertions made by the PSD representatives that the Lawton Canal discharge is of "better" quality than the surrounding creek water. It is "better" only in the sense that it contains fewer coliform bacteria as a result of heavy chlorination. Of course, the bacteria are in no way harmful to the marine life while the discharge has a variety of components which are either toxic or disruptive to the food chain as discussed above. While non-point source pollutants do contain compounds which are hazardous to both humans and marine life, their presence should not preclude efforts to abate further degradation of the water quality through a point source discharge.

While the Marine Resources Division is concerned only with the protection of the marine environment, some comments relative to EPA's apparent commitment to "cost-effective" solutions seem in order. First, the cost projections presented in the draft EIS are too simplistic in nature. Data has been presented on the present net worth and projected annual user costs for the various disposal alternatives. However, no attempt has been made to evaluate the effect of these various alternatives on such things as property values, the tourist trade, commercial fisheries, etc... Since the island's clean environment is of paramount importance in determining the success of fisheries, tourism and real estate investments, hedging on the costs of wastewater disposal at the expense of the surrounding environment would be false economy. In addition, your "cost-effective" solutions would result in minor savings on the Sea Pines - Forest Beach PSD sewer bills at the expense of all the citizens of Beaufort and Jasper Counties who utilize the marine resources of the area for recreation or a livelihood. In a yet larger sense, marine resource user groups along the entire South Carolina Coast would be forced to endure a hardship, in the form of environmental degradation, as a result of the precedent set on Hilton Head for marine wastewater disposal from new development.

We strongly urge EPA to recommend that marine disposal of wastewater be prohibited and that the present outfall in Lawton Creek be eliminated, by whatever means, immediately. With the elimination of the buffer zone around Lawton Creek we can begin to work on methods of controling the non-point source pollution and, hopefully, return all the waters around the island to the pristine state in which Sea Pines found them, twenty-five years ago.

Sincerely,

J Stephen Hopkins

J. Stephen Hopkins
Regional Marine Biologist
Office of Conservation, Management
& Marketing

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta, Georgia 30333
(404) 262-6649

June 25, 1982

Mr. John E. Hagan, III, P.E.
Acting Chief, Environmental Assessment Branch
Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Hagan:

We have completed our review of the Draft Environmental Impact Statement (EIS) for Hilton Head, South Carolina, Wastewater Facilities. We are responding on behalf of the U.S. Public Health Service.

Since water quality data have indicated that non-point source pollution from stormwater run-off is a severe problem and may worsen, we agree that EPA funding should be dependent upon the development of a non-point source control program within the public service district (PSD). We note, however, that at present there is no existing authority or legislation for implementing such a program (page IV-4). We suggest that the final statement elaborate on steps being taken by the PSD to ensure that an appropriate agency receives the authority necessary to implement the recommendations provided by EPA.

We have reviewed the subject EIS for potential vector-borne disease impacts. No serious vector problems are expected as a result of this project.

We appreciate the opportunity to review this draft document. Please send us a copy of the final statement when it becomes available.

Sincerely yours,

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Center for Environmental Health

6 Hummingbird Court
Hilton Head Island
South Carolina 29928
June 23, 1982

E. T. Heinen, Chief
Environmental Assessment Branch
EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Sir:

The Hilton Head Island members-at-large unit of the League of Women Voters has studied the final draft of the "Environmental Impact Analysis Statement for Hilton Head Island Wastewater Facilities", dated February 1982. It is our value judgement that none of the alternatives listed in this document is completely satisfactory as a solution to the problems associated with wastewater management on the island. The League commends those agencies involved in this document for their diligent and comrehensive study thus far, but urges them to continue seeking other, more satisfactory solutions.

Issue No. 4

The League fully agrees with DHEC that effluent must be treated. Our recommendation is for tertiary treatment to potable form and recycling. We are against the discharge of treated sewage into the waters around Hilton Head Island which may be harmful not only to island residents, but also to neighboring communities. There must be assurance that any proposal to discharge wastewater downstream does not result in the domino effect where the last property owner suffers.

No alteration of existing waterways, lagoons, ponds, rivers, streams, etc. should be allowed unless a change would inceease the filtering of non-point run-off and not adversely affect the natural drainage systems or existing waterflow.

The League urges support for policies to reduce the nonessential part of waste streams and the recovery of the nonreducable portion so as to ensure safe disposal of the rest. This would preclude dumping in areas where shellfish harvesting and recreational fishing would be severely affected and would

E.T. Heinen, continued

result in loss of income to many native islanders.

The section on Mitigative Measures makes it clear that there must be cooperation by Beaufort County. Such measures as reduction of impervious surfaces of parking areas, etc., on-site retention or percolation of run-off, the use of wetlands for purification of storm water run-off, not overloading wetlands which may harm natural vegetation, and encouraging erosion and sedementation controls on sites adjacent to bodies of water, are the areas in which local government must act in order to lessen the impact of population growth on the environment.

Issue No. 10

The League study of the Environmental Impact Statement raises a question which we ask respectfully. Has the EPA ever considered the possibility and feasibility of consolidation of all the Public Service Districts and the independent Waste And Sewage Companies on Hilton Head Island as an alternative? If not, then may we suggest such a study which may reveal that the financial burden on any one segment of the island may be lessened. Also, that golf courses which do not have available treated effluent to meet their irrigation needs at this time may benefit from the excess treated effluent of other areas on the island. The mechanics of exercising condemnation authority for land acquisition may be simplified. Duplication of facilities and services may be eliminated and the problems of Hilton Head Island wastewater disposal could be taken care of on the island where it originates.

At this point in time it appears that even the experts cannot agree. Therefore, the League cannot presume to have a final solution. We ask only that there be further study to seek the alternative which would assure waters that are safe to swim in, habitable for acquatic life, free of nuisance conditions, and usable for commercial and recreational fishing. This is imperative for the health, safety, and economy of this island.

Yours truly,

Nancy Ann Ciehanski

Nancy Ann Ciehanski, President
Hilton Island MAL Unit,
League of Women Voters

Above presented before a Public Hearing on June 23, 1982
at the Hilton Head Elementary School by
Beatrice F. Chait, Hilton Head Island Unit - Secretary

COMMENTS AND RECOMMENDATIONS

for

U.S. ENVIRONMENTAL PROTECTION AGENCY'S
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR HILTON HEAD ISLAND, SOUTH CAROLINA
As presented for Public Hearing on June 23, 1982.

Submitted by
THE HILTON HEAD ISLAND COMMUNITY ASSOCIATION, INC.
June 23, 1982

RECOMMENDATIONS

1. Any plan for disposing of effluent generated on Hilton Head Island should be approved by all governmental agencies charged with protecting the area's environment.

   Approval should be based on evidence from preliminary on-site tests, and/or implementation of the plan at other similar locations, demonstrating that the plan will have negligible, adverse effects on the environment.

   Such approval should be required for plans to correct existing problems, or to increase the capacity of an existing system, or to install a new system.

2. Any plan for disposing of effluent should be cost-effective for current users in the area to be served.

   a. The plan should not risk creating a problem, the solution of which would require additional capital investment or increased operating costs.

   b. The plan should not risk creating problems which would affect other areas.

   c. If the plan is to correct a problem resulting from system design or installation, either no cost should be imposed on current users, or the plan should return to the area a benefit other than the problem's correction.

Issue No. 9

3. An island-wide plan for sewage treatment and disposal should be created and implemented. Such a plan would help avoid problems arising from piecemeal, uncoordinated development of sewage systems on the island, would facilitate the maintenance of standards, and would aid the cause of orderly development.

   The plan should include:

   a. Development of an extensive water quality baseline for the entire island, as recommended by the EIS. (IV-7)

   b. Ascertainment of the capacities for effluent absorption for all areas of the island. This information could help to determine advisable rates and extents of developments.

3. Island-wide plan. (cont.)

   c. Study, or restudy of disposal sites and methods other than presented in the EIS. These might include:

      (1) Irrigation of roadsides, medians and/or private property.

      (2) Recycling of purified water through the potable water supply via aquifers and/or storage tanks.

      (3) Anaerobic generators.

Issue No. 4

   d. The development of better controls and/or more stringent enforcement of existing regulations, as recommended by the EIS. (III-20, IV-6)

   e. Encouragement, to the extent possible, of water conservation techniques by public and private water users, as recommended by the EIS. (II-6)

Issue No. 1

4. Vigorous pursuit of regulation and correction of non-point source pollution. This would include the continued development of techniques as well as development of regulation and enforcement procedures.

COMMENTS

In addition to the people, the environment of Hilton Head Island is its most important asset. The climate, the land, the waters and the air all undergird the island's economic and social base.

The high quality of this environment attracts people and their investments in homes, businesses and vacations. The island will remain a potent attraction so long as it retains a high environmental quality.

Our comments and recommendations are keyed to the EIS's objective, which is "to select a wastewater management program of Hilton Head Island that is compatible with the protection of the area's sensitive resources, particularly water quality, while recognizing the existing extensive development pressures." (xiv, D)

The topics we address are, in order:

1. Protection of the area's resources.
2. Extensive development pressures.
3. A wastewater management program for HHI.

PROTECTION OF THE AREA'S RESOURCES

Planning and Monitoring

The importance of planning is illustrated by Sea Pines' current problems.

Plans for the disposal of effluent from the Sea Pines 2.0 MGD plan could not, in 1978, be entirely accomplished; the golf courses could not accept the amount of effluent being produced. To relieve the golf courses, about 3/4 of the effluent was discharged into Lawton Canal. (III-J-12) Thus the original plan, to use only the golf courses, was only about 25% effective and, in addition contributed to contaminating the waters associated with the Lawton Canal. (II-7)

Continued population growth will call for continued expansion of our sewage treatment systems. If planning for that expansion is no more effective than the Sea Pines example just cited, our region will be faced with a problem of truly impressive magnitude as the island and the neighboring mainland approach buildout.

Because planning involves so many complex variables, because no comprehensive plan exists, and because unanticipated problems have been experienced here, we suspect that any plan will risk some degree of failure. To minimize that risk, we recommend that all governmental agencies charged with protecting the area's resources approve plans for effluent disposal before implementation is permitted.

Monitoring provides regulating agencies with information on the state of our island, and indicates the extent to which plans work out in practice. Several monitoring programs are already in effect or are being designed by DHEC, S.C. Water Resources Commission, the Army Corps of Engineers, and the Beaufort-Jasper Water Authority.

The EPA states that additional information is required for the effective monitoring of our water quality. We endorse the EPA's recommendation to develop "a more extensive water quality baseline of the entire island so that data exist against which to measure future water quality changes and assess significance of changes." (IV-7)

We also recommend that data gathered by DHEC, SCCC, EPA, Rural Water Authority, S.C. Water Resources Commission, the Army Corps of Engineers and similar agencies be routinely shared with each other, and with the Beaufort County Joint Planning Commission.

In addition to its other uses, the data should be used to help determine island capacities, and thus rates and limits for construction and land use in our region.

EXTENSIVE DEVELOPMENT PRESSURES

Much of Hilton Head Island's development complements the high quality of nature's work. Our man-made environment, including homes, accommodations for transients, and sports facilities, help to make Hilton Head Island a desirable place to visit and to live.

However, particularly because of information presented in the Joint Planning Commission's State of the Island Report, the community has become more acutely aware of the extent to which development can degrade the quality of living here, of the burdens that people put upon the land and the waters. There is deep concern that the island's capacities will become irreversibly overburdened.

The "existing extensive development pressures" noted in the EIS's statement of purpose must not be allowed to force a decision in the selecting of a wastewater management system. Those very pressures helped to generate Sea Pines' present dilemma, and created a problem, the solution of which will probably require residents of Sea Pines and Forest Beach districts to pay increased costs for no increase in services. (viii)

The interests of Hilton Head Island's residents and visitors will be poorly served if the island's capacities for safe disposal are exceeded, and if users must pay for mistakes not of their own making.

To help protect the interests of the island's residents, visitors, and tourist industry:

1. We support the EPA's recommendations for the development of better controls, and the more stringent enforcement of existing regulations as detailed in the EIS under "Mitigative Measures". (III-20 et seq, IV-5 et seq)
2. We recommend that any plan for correcting existing problems or those which arise in the future, and which will require additional financing or operating costs, be cost-effective for current users. That is, either no additional charge should be made, or the additional cost should, beyond correcting the problem(s), result in positive benefits to the community.

The Hilton Head Island Community Association supported, and continues to support South Carolina Coastal Council's proposal that no discharge of effluent to the surface waters around Hilton Head Island be permitted.

One concern about this method of effluent disposal is that the precedent thereby established at any location would make surface water discharge a readily-available option for all other locations. This could happen even if poor results occurred in the initial case, on the grounds that water quality would not be lowered since it would have been already polluted.

A second concern stems from the mobility in tides and currents. Should unexpected pollution or other undesirable conditions occur, nearby areas would be very easily affected. Hilton Head Island itself could be "boomeranged" by its own, or by others' effluent similarly discharged.

Thirdly, we note the sharp disagreement of other agencies with EPA over the acceptability of discharging effluent to our surface waters. When different agencies, each charged with protecting public interests in the environment reach such radically different conclusions, we think it prudent to recommend against implementing a plan.

The following quotations illustrate opposition to surface-water discharge of effluent. The statements are from responses to the draft of South Carolina Coastal Council's Special Area Management Plan for Hilton Head Island, dated February 8, 1982. With regard to effluent, the Plan recommended that:

> "No discharge of treated effluent to the surface waters around Hilton Head Island should be permitted."
>
> "Any solution for the disposal of treated effluent should be comprehensive and should include the entire island." .

Responses to those recommendations included the following:

> "The recommendations offered by the Coastal Council in reference to both the discharge of treated effluent and non-point source runoff should be accepted and put into effect as soon as possible."
>
> Charles M. Bearden
> S.C. Wildlife & Marine
> Resources Department
> (letter of 3/12/82)
>
> "The National Marine Fisheries Service fully supports the concepts put forth in this plan for the protection of the resources on and around Hilton Head Island. These areas are extremely important to fishery resources and are quite fragile due to development pressures."
>
> D. R. Ekberg
> U.S. Department of Commerce
> (letter of 2/22/82)

Disposal of effluent on land, at a rate and by methods consistent with the absorptive capacity of the disposal site, is far preferable to discharge to surface waters.

However, we believe that Hilton Head Island's problems should be solved on Hilton Head Island. It is patently unfair to pre-empt the use of off-island land from those who may later require the use of that land. We agree with the point of view, for instance, that Bluffton should not become our septic tank.

We recommend that a site, or sites on Hilton Head Island be acquired for effluent disposal, or that other methods and technologies be explored. Among these could be:

1. Irrigation of roadsides, medians and/or private property.
2. Recycling of purified water through the potable water supply via aquifers and/or storage tanks.
3. Anaerobic generators.

June 23, 1982

Public Hearing on Environmental Impact Statement
regarding Wastewater Facilities for Hilton Head Island

W.L. Longnecker - Chairman, Island Concerns Committee;
Association of Sea Pines Plantation Property Owners

We found the wastewater facilities draft very informative and accept the report as a good, comprehensive study of the problem on the Island. We feel, however, that a decision on the recommended options may be premature at this time.

Issue No. 1

First, the report emphasizes that the non-point source problem is the most serious of the water disposal problems on this Island, to the point that Federal Funding for any wastewater project is contingent upon the correction of non-source runoff. The Section 208 study which is currently being prepared is expected to recommend methods to control the non-point source pollution and must be integrated with the wastewater management recommendations before final decisions should be made.

Next, Island-wide coordination of all the wastewater management programs is recommended. There is no platform yet to accomplish this. It might be possible that considerable monies could be saved, and a better overall Island management would result.

Issue No. 9

Third, having heard the proposals of the Sea Pines Public Service District regarding the feasible program to upgrade the wastewater to Lawton Creek from secondary to tertiary water, I think that action justifies a delay to allow measurement of the positive impact on the system.

The additional spray irrigation and wetland recharge proposals are important options to consider. The questions are which areas can be best benefited by spraying; how much actual usage can golf courses absorb; and how much water can selected areas and wetlands take? If it is feasible to reuse instead of dispose of the water, that is ~~the~~ most desirable and the long range saving of the potable water for future generations is commendable.

Issue No. 4

A delay of action is normally not an acceptable decision. However in this case it might be advisable to delay a decision for a reasonable period until the related facts are available; until more questions are answered; and until important correlation is completed.

HILTON HEAD ISLAND COMMISSION

POSITION PAPER - ENVIRONMENTAL IMPACT STUDY

This Commission, recognizing that the EIS primarily is a study of the Sea Pines Public Service District and its present and future disposal of waste water, accepts the study on its "face value" with certain exceptions. We feel that the study and its proposals present environmental problems and observations and offer solutions which do not fully answer the total Island's future growth. Therefore, our acceptance is one of acceptance of the study as a tool, a beginning point, to further reconsider the problems presented. For example:

Issue No. 1

1. It points out the problem and importance of storm water-run off as serious, but offers no real solutions.
2. The same concerning septic tank operations with respect to non-point pollution.
3. Establishes "good areas" for septic tank operation... ...."Slight" pollutant problems.
4. States that the 208 Study must be adjunct to this study, particularily the septic tank operations - but this study is not completed at the present time.
5. Its waste water management and disposal proposals seemed based more upon economic factors, than upon long lasting impact.
6. It lacks serious treatment of the effect of waste water disposal proposals on present potable water supply.

Basic observations of Study:

The non point pollution problem.

- Study points out that non point problem sources must be controlled before Federal funding is available.
- All nine (9) options for SPPSD effluent disposal fail to take on the problem of non-point pollution.
- That the 208 Study concerning effective management practices to abate non point pollution, is to be an adjunct to the EIS.
- That the OBERS criteria for projected population is not reflective of the Island trend-plus tourism. Issue No. 2
- Broad Creek PSD growth to a capacity of 1.2 mgd in 1981-1983, then to a figure of 1.8 mpd in 1984. Where will this effluent go?
- Discharge to the Sound, Ocean or Port Royal - fundamentally sound, but does not resolve non-point pollution problem.
- The septic tank operations and failures given minor/cursory discussion. A main NPP problem? Issue No. 11

CONCLUSION - PROPOSALS:

1. The Non point pollution problem is the most serious, immediate environmental threat to the Island. 208 study or not we propose the following:

Issue No. 11

a) Septic tanks -
At present, the only concern is that of Owners when system backs up. Need to develope a monitoring system and further, where PSD exists, develope program to inspect, evaluate operations, then criteria for time these units must go on line (i.e. - years in operation, faulty operation causing leakage or non point pollution of adjoining/adjacent waters, etc.).

Issue No. 1

b) Storm Water Runoff -
Need to review status of 208 study. While we know of no real program on-going in the U.S., there must be some. Evaluate these. We point out that the DSO amendments will contain requirements for developers to develope run-off systems to handle the first inch of water run off. As stated, we believe this to be the major problem.

2. Effluent Disposal. Finally we are against those proposals submitted, that offer open waters discharge into Calibogue, Port Royal or the Atlantic. While the effluent may meet all quality standards, we submit there are both short-range and long-range problems.

a) Open discharge presents no curb on population growth. Encourages development and should SPPSP receive such approval, then PSD's all can.

b) Presents again no solution to NPP.

Issue No. 4

c) Has a negative effect on potable water usage. One of our concerns, the study lacks attention to our water reserves, their use and preservation. With open water discharge, as opposed to irrigation, spraying, flooding programs as proposed, all the good water goes out to Sea and we will continue to pump some 70% for irrigation purposes as presently. Waste water totals up to be 30% of water pumped. Why not save 30% of the 70% now being used for irrigation purposes. Use for spray, golf irrigation, residential, farm, business, industrial use, etc. -

The real problem is again - population growth. Our conclusion is basically that the real population, growth, plus tourism, far exceeds those projected in the study and far exceeds projected build out programs.

COMMENTS ON HILTON HEAD ISLAND ENVIRONMENTAL IMPACT STATEMENT PRESENTED AT PUBLIC HEARING ON JUNE 23, 1982

The Draft Environmental Impact Statement has considered a number of alternatives for wastewater disposal. Through your review process the list was narrowed down to five for which costs ranging from $1.8 million to about $15 million were identified. These were:

		Capital Cost
1.	Lawton Canal Discharge w/Tertiary Effluent	$ 1.77 million
2.	Calibogue Sound Discharge w/Secondary Effluent	$ 2.03 million
3.	Rapid Infiltration w/Secondary Effluent	$ 7.86 million
4.	Spray Irrigation on HHI w/Secondary Effluent	$14.93 million
5.	Spray Irrigation off HHI w/Secondary Effluent	$13.83 million

During the three plus years that the EIS has been in process, the Sea Pines Public Service District has continued to seek its own ways to use and dispose of the treated wastewater. Some of our efforts include:

1. Continued spray irrigation on the Club Course and Shipyard Golf Courses, and to construct new lines to spray irrigate the Ocean, Sea Marsh, Harbour Town and the new nine hole course in Shipyard. This will provide spray irrigation on 5½ golf courses--all that are located within the Sea Pines and Forest Beach Public Service Districts.
2. Gained approval for pumping treated wastewater to the Forest Preserve to re-establish a wetland. A three-year program will be conducted to determine the quantity of water this wetland

can accommodate. We will be pumping 600,000 GPD the first year 1.0 MGD the second year and 1.5 MGD the third year.

3. We have conducted a study on the dispersion and environmental impact of a secondary effluent introduced to deep water at the southern tip of Hilton Head Island. We hope that we will never have to construct an outfall in Calibogue Sound, but we have felt the need to evaluate this alternative to a greater degree than you have in the EIS.

Issue No. 6

Cubit Engineering from Clemson, South Carolina, performed the study in March of this year and their report has been made available to the EPA staff. The study has determined that there would be no adverse impact on the environment from a 3 MGD discharge at the southern tip of Hilton Head Island. In fact there would be no change in background concentrations of any of the parameters.

4. We have moved ahead with a treatment plant expansion that include an environmentally sound method of sludge disposal. We will be injecting the sludge into a sand media located at the treatmen plant that has an underdrain collection system. The water remove from the sludge will be pumped back to the treatment plant and the sludge mixed with the sand will provide a top soil that can be used for landscaping yards and flower gardens.

5. We have investigated actions taken by other communities in reusin treated wastewater. St. Petersburg, Florida, has treated their wastewater with tertiary filters and disinfected to a degree that health officials are satisfied that viruses have been killed

Issue No. 4

This process allows the City to use treated wastewater for spray irrigation of golf courses, parks, road shoulders and medians, and landscaping of individual yards as well as for fire protection.

The results of this EIS have significant importance to the Sea Pines and Forest Beach Public Service Districts. In 1978 the Districts received an order from the State Department of Health and Environmental Control (DHEC) that required a study of wastewater disposal alternatives. The EIS became that study. Within 90 days of the EIS completion, the District must submit an engineering report detailing the concept for implementation of the selected alternative. Within 270 days of approval of the engineering report, the District must submit plans and specifications for construction of the facilities. The facilities must then be constructed in accordance with a schedule developed by DHEC. If the study is finalized as presented, we will have no choice but to pursue the Sound discharge alternative.

There are a number of items in the draft EIS that give concern to the District:

1. The draft indicates that some of the alternatives for effluent disposal will allow the unbridled development of the Island. We contend that denial of sewage service will only cause developers to seek ways to dispose treated wastewater on the Mainland. This is in fact already being done. The added costs will then cause a higher number of units to be built to cover the increased cost of sewage treatment and disposal. The limits on development densities should be handled by local ordinance and are presently being pursued by the JPC and Beaufort County Council.

2. The removal of the present outfall from Lawton Canal will not open any of the closed shellfish areas. Water in the Lawton Creek, Point Comfort Creek and portions of Broad Creek do not presently meet SA standards because of runoff pollution. We realize there would have to be a buffer zone for any outfall from a treatment plant, but this buffer zone falls between two other buffer zones--those for Harbour Town and Palmetto Bay Marina.

3. Federal funding for any of the selected alternatives would be limited to that portion of the work required to eliminate the present outfall. This funding would be used to assist present customers and would not be used for plant expansions for new development.

Issue No. 1

The EIS, however, prohibits any Federal funding unless a storm water runoff program is implemented for Sea Pines and Forest Beach. Neither Public Service District has authority to work in this area and it is questionable as to the program that could be implemented. I say this because all work done by the 208 study and by the Coastal Council, as well as the JPC's development standard ordinance, deals with runoff for new development. None of these seem to have a solution for runoff pollution for developed areas such as Sea Pines and Forest Beach.

We raise the question: Does EPA have a suggested program for controlling or treating runoff from developed areas? If you were given the responsibility to stop contamination of oyster beds, what reasonable action would be taken?

Issue No. 4

The Sea Pines and Forest Beach Public Service Districts feel there is considerable study still needed to insure that treated wastewater is used to its maximum. We have a limited amount of good drinking water and it is being used in great quantities for non-potable purposes.

Our plan is to do the following:

1. Continue the three-year program on the wetlands recharge and work to gain more land in the Forest Preserve. Recently there was some land given to the Island Audubon Society by Mr. Don Schrader. This land and other tracts may be available for water recharge.
2. Monitor the water used on the present and new golf courses to see how much water each is using and work with golf course superintendents to try to maximize use of the treated wastewater.
3. Pursue the use of tertiary effluent for spray irrigation throughout Sea Pines and Shipyard. The construction of water mains to the five golf courses provides a delivery system for spraying treated wastewater on landscaped areas similar to the system used in St. Petersburg, Florida. We know that great quantities of potable water are used for these purposes, but we need to quantify this use and see how much treated effluent could be used.
4. We would like to install tertiary filters as soon as possible so that the best quality water can be provided for spray irrigation, and that any continued discharge to Lawton Canal will meet limits of 5 mg/l for both BOD and suspended solids. This plan is in fact one of the alternatives discussed in the EIS.

Issue No. 4

5. By providing a tertiary degree of treatment, we would then ask to have the limits of discharge removed so that the Districts can proceed with meeting their obligations to serve.

   It is necessary to lift the limit on the amount discharged to Lawton Canal in order to serve the vacant lots within the developed subdivisions and to serve the areas presently on septic tanks. (Currently there are 906 houses in Sea Pines still on septic tanks or 37% of all houses in Sea Pines.)

6. At the end of a reasonable time, see if we can accomplish a zero discharge. This is our desire--to have a 100% reuse of the wastewater. We would also like to see if County Council and the Coastal Council are able to make any progress in improving the existing water quality in Lawton Creek and Broad Creek.

7. If at the end of the designated period we have not obtained a zero discharge and if progress has been made in eliminating the non-point pollution from the developed areas, we would then pursue the other alternatives allowed in the EIS.

We ask your consideration in writing the final EIS in such a way that the program I have outlined be classed as an acceptable alternative to EPA.

Broad Creek Public Service District

P.O. Box 5628
Hilton Head Island, South Carolina 29938

Commissioners
Newton A. Lieurance, Sr.
Chairman
Leslie M. Bernick
Robert E. Huber
Carl H. Lind
James L. Rowe

803-785-1104
William T. Hunter
Manager

June 14, 1982

Mr. E. T. Heinen, Chief
Environmental Assessment Branch
Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

RE: HILTON HEAD ISLAND, SOUTH CAROLINA
ENVIRONMENTAL IMPACT STATEMENT

Issue No. 2

Issue No. 9

Dear Mr. Heinen:

We have previously expressed deep concern with the population and flow projections contained in the Draft Environmental Impact Statement (EIS) and we herewith reiterate that concern. We fully realize that the OBERS-based population projections must be used to evaluate alternatives. However, by so doing, consideration of alternatives for the majority of the Island has been almost totally disregarded. In essence, the EIS presents an in-depth study of alternatives for the two public service districts which provide service for approximately thirty percent of the Island. But these two districts presently have about fifty percent of the Island's population and also have the most critical wastewater treatment and disposal problems. However, it seems incomprehensible that potential problems and solutions for the remaining seventy percent of the Island would be so blatantly disregarded by using population data that is obviously erroenous. If, as purported, the EIS is applicable to the entire Island, alternatives available to all PSD's and Non-PSD areas should be evaluated and the preferred alternative(s) described.

Attached hereto are copies of previous correspondence, none of which has been acknowledged by EPA but all of which express our concerns about the EIS.

Very truly yours,

BROAD CREEK PUBLIC SERVICE DISTRICT

William T. Hunter
Manager

WTH:eh
Enclosures

HHI - EIS

Broad Creek Public Service District

P.O. Box 5628
Hilton Head Island, South Carolina 29938

Commissioners
Zack J. Van Landingham
Chairman
Carl H. Lind
Newton A. Lieurance, Sr.

803-785-110
William T. Hunt
Manager

August 20, 1981

Mr. Charles Jeter, Regional Administrator
Environmental Protection Agency
Department of Natural Resources
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30308

RE: HILTON HEAD ISLAND
ENVIRONMENTAL IMPACT STATEMENT

Issue No. 2

Dear Mr. Jeter:

On several occasions within the past nine months, Broad Creek Public Service District has expressed its deep concern with the population and flow projections contained in the Environmental Impact Statement. The question was asked of Mr. Robert Cooper on December 9, 1980, if the projections shown in the EIS would be interpreted as being limitations. Mr. Cooper confirmed that the OBERS population projections are utilized in allocating EPA funds and funds will not be granted to any project if the actual populations is in excess of the OBERS population.

The EIS indicates that the peak monthly average flows for the year 2000 for Broad Creek Public Service District based on OBERS is 0.64 MGD.

This value is extremely low inasmuch as the actual peak monthly flows at the Broad Creek Public Service District Plant are approaching 0.6 MGD at this time. As a matter of record the South Carolina Department of Health of Environmental Control has issued a conditional construction permit to the District to double the capacity of the treatment plant to 1.2 MGD. This contract has been awarded, construction has started and will be completed by April 1, 1982.

Undoubtedly some of the other public service district of Hilton Head will also be experiencing this same situation. This places everyone at the distinct economic disadvantage because it precludes the potential of receiving EPA Grant Funds to offset part of the construction costs. Inasmuch as the OBERS population is obviously incorrect because the actual population and flows will in 1983 exceed the PBERS population projection for the year 2000, it is respectfully requested that EPA review this information and take whatever steps are necessary to correct this obvious inconsistency.

The District is also very disturbed by the connotation of "no action" in the Draft EIS. Broad Creek Public Service District has a history of providing wastewater treatment facilities IN ADVANCE of the need thereby precluding the discharge of effluent not in accordance with the Department of Health and Environmental Control standards. Unlike others, we take pride in providing adequate capacity before it is needed rather than waiting until plant capacity is exceeded before starting. We therefore object to any inference that no action is being taken and respectfully request that this terminology be corrected.

Very truly yours,

BROAD CREEK PUBLIC SERVICE DISTRICT

William T. Hunter
Manager

WTH:eh

cc: BCPSD Commissioners
Hussey, Gay & Bell
Cary Griffin

[illegible]

June 16, 1981

Mr. Robert Cooper
Environmental Protection Agency
EIS Project
345 Courtland Street, N.E.
Atlanta, Georgia 30308

RE: BROAD CREEK PUBLIC SERVICE DISTRICT
HILTON HEAD ISLAND, SOUTH CAROLINA

Dear Mr. Cooper:

Enclosed is a copy of the 10-year plan as adopted by the Commissioners of the Broad Creek Public Service District. This plan indicates the projected population and capital improvement projects necessary to provide services to the area within the public service district.

Issue No. 2

As we have mentioned to you on several occasions, the District is particularly concerned about the population and flow projections contained in the EIS. In addition, we are concerned about the various effluent disposal alternatives which are being evaluated for Broad Creek Public Service District and for other districts on the island.

In a recent article in the "Island Packet" we noticed that the draft EIS has been submitted to the EPA and is under review. We would appreciate very much the opportunity to discuss this draft with you and will be happy to arrange to meet you in your Atlanta office. We would also request that Ms. Louise B. Franklin and Mr. D. Randolph Grubbs be requested to attend this meeting in order that we could have the benefit of their input.

Please let us know when it would be convenient to meet with you.

Sincerely,

L E Dye

LONNIE E. DYE, P.E.

LED/jdt

cc: Mr. Bill Hunter
Mr. Mike Jordan
Ms. Louise B. Franklin
Mr. D. Randolph Grubbs

Enclosure

Commissioners
Zack J. Van Landingham
Chairman
Carl H. Lind
Newton A. Lieurance, Sr.

Broad Creek Public Service District

P.O. Box 5628
Hilton Head Island, South Carolina 29938

803-785-1
William T. H
Manage

TO: Distribution

FROM: William T. Hunter

DATE: May 5, 1981

SUBJECT: TEN YEAR PLAN

Enclosed is the final plan which has been modified to include some capital imput from Hussey, Gay & Bell.

The important points to consider while digesting this are:

Units. The master plan for the Zone II property has not been developed; therefore, the number of units included (1,560) was an "off the wall" guess.

Timing. The timing of developing property for sale or for improvements on existing lots is pure conjecture at this time.

We followed a consistant ten year plan which resulted in 100% developed and improved property by 1991.

This is a sliding scale control and by slowing down or speeding up will affect expansion and income accordingly.

Dollars. All income and expenses are shown in today's dollars with no consideration given for inflation. At best we would hope that they (income and expense) would offset each other.

Debt. No provision was given for additional debt but the amount to be funded is evidenced by the accumulative negative cash position in years 1982 thru 1988.

Replacement. $75,000 per year has been set aside for replacing existing facilities. This is an arbitrary amount and could easily be double this.

Operating Expenses. We show a nominal increase each year of $50,000. Over the ten year period this would result in doubling the 1981 operating costs.

William T. Hunter

WTH:eh

Distribution:
- Zack J. VanLandingham
- Newton A. Lieurance, Sr.
- Carl H. Lind
- Gus Bell
- Lonnie Dye
- Cary Griffin

BROAD CREEK PUBLIC SERVICE DISTRICT

USAGE/REVENUE

April 30, 1981

Single Family

Fixed - 95 units @ $20 per month	$ 22,800 Annual
Metered - 149 units @ $25 (average) per month	$ 44,760 Annual

New homes are being processed at ten per month. For this projection we will use 100 units per year tapping into the system.

Availability - 767 units @ $108	$ 82,836
Total Single Family	$ 150,336

As of November 1, 1981 everyone will be metered and the user income will increase in most instances.

At 12/31/81 we should have the following inventory:

295	Metered hours @ $25 per month	$ 88,500 Annual
30	Under construction	
686	Unimproved	
1,011	Total	

Multi-Family

Fixed - 589 units @ $20 per month	$ 141,360 Annual
Metered - 380 units @ $25 per month	114,000
	$ 255,360

Under construction - 128 units

At 12/31/81 we will have 1,097 metered condominiums.

1,097 @ $25 per month	$ 329,100 Annual

Commercial

Present billings average $150,000 per year but next year we have deleted the PDR irrigation of Queen's Folly -- about $6,000. The fixed charge to Outdoor Resorts has been deleted also.

SUMMARY

The annual billing as of January 1, 1981:

Single Family	
Metered	$ 88,500
Availability	74,100
	$ 162,600
Multi-Family	
Metered	$ 329,100
Commercial	$ 150,000
Millage	$ 38,000
Total	$ 679,700

User revenue includes 1,392 units @ $5 (excess) x 12 months = $ 83,520

NEW CUSTOMERS

Single Family

One-third of the applications have been for the Inverness Section. Based upon 75 completed houses per year, we would experience the following:

	Units	Amount	Cost Per Tap
Mariner	50	$750	$1,000
Inverness	25	$750	$ 100
	75		

Summary:

Revenue - 75 @ $750	$ 56,250
Costs	
50 @ $1,000	50,000
25 @ $100	2,500
	$ 52,500
Net Income	$ 3,750

Actually with the build-up starting to happen in Mariner, we are now experiencing houses being constructed next to existing homes; herefore, tapping into existing tanks with only about $100 costs.

Multi-Family

The master plan is not complete for the Zone II property and we cannot determine the yearly or ultimate building rate.

Zone III- Marina property along the west side of Highway 278 will probably experience the following:

1400 multi-family units over a 7-10 year period. Construction will start in 1981 and should result in at least 140 units connecting each year.

Following the density/available property thesis in Zone III, we could realize the following:

Total acres	430
Golf course	150
Other	20
Net acres	260

Density - sixty an acre = 1,560 units

Over a ten-year period will result in 156 units per year.

Summary 296 units per year

Commercial

There should be no commercial in Zone II, but there are plans for 300,000 square feet of commercial/retail/office in the Marina property.

Developed over a five-year period will result in 60,000 square feet being completed each year.

Other

No consideration has been given to expansion of District boundries to the north or south.

It is assumed that the present Long Cove customers will be transferred to Sea Pines PSD before the next fiscal year.

However, there are some out parcels which are completely surrounded by BCPSD and we should include them in our contingency plans.

EGR Property - 3½ acres - 26,000 square feet retail
Mr. Mack - 1½ acres - unknown

Washington Tract - 50 acres - applying a usable acres factor of 90% - 45 acres and a density of six to the acre would result in 270 units.

Summary of ultimate build-out.

Present property owners	1,011 single family 1,097 multi-family
Zone II	1,560 multi-family
Zone III	1,400 multi-family
Total	5,068 units

Commercial
Present - one 360 room hotel
40,000 square feet commercial

Addition - one 324 room hotel
300,000 square feet

Other
26,000 square feet
270 units multi-family

May 27, 1981

PALMETTO DUNES RESORT
ZONE II
Undeveloped

Tract	Ac	Type	Density Per Acre	Total Units	GPD Unit	Total Flow
1	4.7	Villas	12	56	300	16,800
2	6.7	Villas	12	81	300	24,300
3	4.0	Beach Club	--	--	---	10,000
4	6.5	Villas	12	78	300	23,400
5	6.4	Villas	12	77	300	23,100
6	7.8	Villas	12	94	300	28,200
7	9.6	Villas	12	115	300	34,500
8	12.2	Restaurant	600		50	30,000
		Hotel	340 Room	340 Room	100	34,400
9	11.6	Villas	8	93	300	27,900
10	6.15	Villas	8	49	300	14,700
11	5.2	Villas	8	42	300	12,600
12	4.4	Villas	8	35	300	10,500
13	1.6	Residential	--	8	300	2,400
14	3.35	Lots	--	17	400	6,800
15	16.9	Lots	--	45	400	18,800
16	4.6	Lots	--	12	400	4,800
17	3.35	Lots	--	8	400	3,200
18	10.4	Lots	--	24	400	9,600
19	7.2	Lots	--	19	400	7,600
20	5.0	Lots	--	24	400	9,600
21	8.9	Office/Park	--	--	400	20,000
				875		372,000

USAGE

(1)	Present Demands	
	1,392 units @ 350	487,200 gallons daily
	Hotel/Commercial	100,000
	Total Present	587,200
	Reserve	
	716 unimproved lots @ 350	250,600
	Total Committed	837,800 gallons
	Proposed Construction	
(2)	G.E. Parcel	100,000
	Mariner Inn	100,000
		200,000
(3)	Marina Site (Zone III)	
	1,614 units	454,500
	300,000 Square Feet	157,100
	Total Zone II	611,600
	Total known committment	1,627,800
(4)	Zone II	
	877 units	372,000
(5)	Non-District	
	Commercial	10,000
	270 units @ 350	94,500
		104,500

Total potential capacity required - 2,125,900 gallons per day.

May 27, 1981

PALMETTO DUNES RESORT
ZONE III

Pod No.	Description	1 BR. units no.	2 BR. units no.	3 BR. units no.	Commercial
1	Residential		112		
2	Residential		52	12	
3	Yacht Club				4,800
4	Residential	28	68		
5	Residential		38	10	
6	Residential	240			
7	Residential/Commercial	16	20		2,500
8	Residential/Commercial	20	24		2,840
9	Residential/Commercial	15	20		1,900
10	Racquet Club				22,500
11	Bank				200
12	Transportation Hub				500
13	Post Office				500
14	Tour Bus Depot				150
15	Island Villa Rentals				500
16	Chamber of Commerce				250
17	Commercial				4,600
18	Restaurant				21,500
19	Residential/Commercial	8	16		1,640
20	Residential		125	100	
21	Residential	28	59	11	
22	Mall-Commercial				16,000
23	Bandshell				0
24	Church				1,050
25	Church				1,200
26	Residential	38	79	13	
27	Commercial				4,000
28	Commercial				6,600
29	Commercial				3,200
30	Racquet Club				25,000
31	Bazaar				1,000
32	Residential	64	123	35	
33	Residential	58	58	50	
34	Maintenance				1,500
35	Marina Spoil Area				0
36	Residential	21	45	8	
37	Service Center				3,600
38	Commercial				4,600
39	Restaurant				25,000
40	P.D.R. Signage				0
		536	839	239	157,130
	TOTAL FLOW	107,200	251,700	95,600	157,130

220<

Total 611,630 gallons
Total 1,614 units

HUSSEY, GAY & BELL, INC.
CONSULTING ENGINEERS

May 18, 1981

Mr. Robert Cooper
Environmental Protection Agency
ElS Project
345 Courtland Street
Atlanta, Georgia 30365

BROAD CREEK PUBLIC SERVICE DISTRICT
Hilton Head Island, S.C.

Dear Mr. Cooper:

Issue No. 2

As we discussed on May 4th, the Broad Creek Public Service District is very much interested in the ElS for Hilton Head Island. The District is particularly concerned about the population and flow projections contained in the ElS. In addition, we are concerned about the various effluent disposal alternatives which are being evaluated for BCPSD and for other districts on the Island.

On behalf of the District, we respectfully request an opportunity to discuss the draft ElS at the earliest possible date in your office. Please let us know when we can meet.

Yours very truly,

LONNIE E. DYE

gdg

cc: Bill Hunter - BCPSD
Mike Jordan
Claude Terry & Assoc.
Gannett, Fleming, Corddry & Carpenter

Commissioners
Zack J. Van Landingham
Chairman
Carl H. Lind
Newton A. Lieurance, Sr.

Broad Creek Public Service District

P.O. Box 5628
Hilton Head Island, South Carolina 29938

803-785-1104
William T. Hunter
Manager

June 11, 1981

Mr. Lonnie Dye
Hussey, Gay & Bell
P. O. Box 14247
Savannah, Georgia 31406

Dear Lonnie:

Regarding the next set of documents and meetings to be set up by ESI/EPA, we still feel that it is imperative to present them with correct and current data.

Mike Jordan and I feel that a face to face meeting with the people involved would be necessary and important but at least you should submit to them the Ten Year Plan as adopted by the District.

This would verify our dispute with their low estimate of users and required flows. In addition, we want to go on record as stating our position concerning the ability to dispose of effluent with the same options they are recording for the other Districts on the Island.

Thank you.

Very truly yours,

BROAD CREEK PUBLIC SERVICE DISTRICT

William T. Hunter
Manager

WTH:eh

cc: R. C. Onorato
Gus Bell
Cary Griffin
Mike Jordan

CHAPTER V

EIS COORDINATION

CHAPTER V - EIS COORDINATION

PART A. INTRODUCTION

Public participation programs are mandated by Federal Regulations governing the preparation of Environmental Impact Statements. Public participation is an important and valuable part of the EIS process because it provides for active public involvement in developing and evaluating wastewater management programs.

At the beginning of the Hilton Head Island EIS, a public participation program was established to provide opportunities for interested groups, individuals, and government agencies to participate in the development of the EIS. A Review Committee was established to serve in an advisory capacity to EPA and their consultants through a series of committee meetings held during the EIS preparation. In addition, two public meetings and a public hearing were held at various stages in the process, and interested agencies and groups were asked to comment on the Draft EIS.

A complete list of the agencies and interest groups who were involved in the public participation program is presented below.

PART B. AGENCIES AND GROUPS

Public Agency

Beaufort County Council
Beaufort County Joint Planning Commission
Department of the Air Force
Department of the Army Charleston District Corps of Engineers
Department of the Army Savannah District Corps of Engineers
Hilton Head Island Commission
Low Country COG
S. C. Coastal Council
S. C. Dept. of Health & Environmental Control
S. C. DHEC, Shellfish Division
S. C. Wildlife & Marine Resources Department
U. S. Department of the Interior - Office of Environmental Project Review
U. S. Public Health Service

Public Service Districts

Broad Creek PSD
Forest Beach PSD
Hilton Head No. 1 PSD
Sea Pines PSD

Homeowners Associations

Association of Land Owners of Port Royal Plantation
Association of Sea Pines Plantation Property Owners, Island Concerns Committee
Association of Sea Pines Plantation Property Owners, Inc.
Forest Beach Community Association
Palmetto Dunes Property Owners Association
Shipyard Plantation Property Owners Association
Spanish Wells Property Association
The Hilton Head Island Community Association, Inc.

Private Groups

Audubon Society
Beaufort/Jasper County Comprehensive Health Program
League of Women Voters, Hilton Head Island Members-At-Large Unit
May River Committee
N.A.A.C.P., Hilton Head Chapter
Hilton Head Fishing Cooperative
Shellfish Interests
Sierra Club, Nancy Cathcart Group
Sierra Club, South Carolina Chapter

Developers

C and S Investments South
Heritage Properties
Hilton Head Company
Hilton Head Plantation
Palmetto Dunes Resort
Sea Pines Plantation Company

Trade Associations and Business Groups

Chamber of Commerce
Council of Architects
Hilton Head Hospitality Association
Home Builders Association

Private Citizens

Thomas Barnwell
Emory Campbell
Charles Colson
M. T. Laffitte
L. P. Struble, Jr.
Leslie Teal

CHAPTER VI

LIST OF PREPARERS

CHAPTER VI - LIST OF PREPARERS

Project Personnel

U. S. Environmental Protection Agency

Robert B. Howard	Chief, EIS Preparation Section
Robert C. Cooper	EIS Project Officer
William J. Patton	Chief, S.C./Tenn. Facilities Planning Section

Consultants

Gannett Fleming Corddry and Carpenter, Inc.

Thomas M. Rachford	Senior Project Manager
D. Randolph Grubbs	Project Manager
L. Edward Stom	Project Engineer
Kenneth E. Vinson	Assistant Project Engineer
Paul Andre DeGeorges	Environmental Scientist
John W. Jacobs	Environmental Scientist

Claude Terry & Associates, Inc.

Claude E. Terry	Project Executive
Louise B. Franklin	Project Manager, Environmental Planner
Robert J. Hunter	Environmental Scientist
Thomas C. Mather	Environmental Scientist

APPENDIX A. SOUTH CAROLINA COASTAL COUNCIL - HILTON HEAD ISLAND SPECIAL AREA MANAGEMENT PLAN

Special Area Management Plan

for

Hilton Head Island

South Carolina Coastal Council

1982

229-

ENVIRONMENTAL IMPACT STATEMENT
BRANCH
RECEIVED
MAY 12 1982
REGION IV · EPA

HILTON HEAD ISLAND SPECIAL AREA MANAGEMENT PLAN

April 23, 1982

South Carolina Coastal Council

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CHAPTER ONE

Introduction

Hilton Head Island is recognized internationally for its unique barrier island environment that provides the atmosphere for a variety of recreational activities. That Hilton Head Island plays a major economic role in the state's tourism industry, is of important significance. Its importance to the local economy is also obvious. However, in recent years the predictable rush to maximize the development potential of the island has caused concern over long term implications for the natural environment, public resources, and the stability of its economy.

The current year round average population is approximately 14,000. Current peak population counts, however, surpass 40,000. According to local and regional estimates, those figures will increase to 35,000 and 100,000 respectively as parcels that are already master planned develop. Considering the large tracts of land that are not currently master planned, the development potential of those areas, predictions for a "buildout" scenario are 70,000 and 150,000 respectively. Certainly a number of unknowns could affect these estimates, but based upon the best available information and current economic trends, they are not unrealistic.

Current population and development has created an assortment and varying degrees of environmental problems. It should follow that multiplication of these figures buy two or three times will compound any existing problems unless some mitigating measures are implemented. It is on the basis of these assumptions that the following policies are established by the South Carolina Coastal Council in the form of a Special Area Management Plan for Hilton Head Island. These Policies pertain only to new projects or the expansion and significant alteration of existing projects and activities.

B. Existing Policies, Rules, Regulations, and "State of the Arts" Findings:

Coastal Management Plan (III-35, 1 d) Wastewater discharges should be located where they pose the least ecological threat - in areas where disruption of wetlands can be avoided, in areas with good tidal flushing, and along water courses with relatively low water quality classification.

Coastal Management Plan (III-60) Other than actual location of facilities in sensitive areas, the major negative impact associated with sewage treatment systems is the potential water quality degradation from effluent discharge.

Coastal Management Plan (III-61, 1 a) Sewage treatment facilities and transmission systems must meet applicable federal, state and local water quality standards.

Coastal Management Plan (III-61, 1 d) Sewage treatment facilities will limit discharge as much as possible in areas containing productive shellfish beds. Construction of facilities shall in no case degrade the existing water quality classification, and if the current classification is not the highest achievable, the plans must show a consideration for the water body ultimately achieving the highest classification.

Coastal Management Plan (III-61, 1 e) Outfall locations should consider water depth, circulation and mixing to protect water quality. Maximum study should be given to alternatives to conventional treatment methods; for example land disposal, water conservation techniques, land application, and overland flow.

Coastal Management Plan (III-62) In the coastal zone there is an overlap of state agency authorities for sewage treatment facilities. The permits of these agencies (e.g., DHEC) are subject to the review and certification of the Coastal Council to ensure compliance with the policies of the Management Plan.

Coastal Management Plan (III-61, 2 a ii) Sewage treatment facilities should not be constructed in or immediately adjacent to wetland areas and must be designed such that no effluent will be discharged into areas open for shellfish harvesting.

"State of the Arts" Concepts Treated sewage discharge into estuarine surface waters can create several problems. Secondary treatment generally includes chlorination to remove bacterial pathogens. Chlorine reacts with several constituents of seawater, even at low concentrations (>2ppm), to produce other compounds known to have deleterious health effects. Chlorine itself is known to have deleterious effects on aquatic life (ex., deterioration of gill tissue in fish leading to gas exchange disfunction). Viral pathogens are unaffected by treatment, and their release into surface waters could increase the probability of viral infection as well as the contamination of aquatic organisms, rendering them hazardous for human consumption. Ultraviolet and ozone could be possible alternatives.

Secondarily treated effluent also contains nutrients such as nitrogen and phosphorus that serve as limiting factors for primary producers. Subtle changes in concentrations of these nutrients can result in changes of types of primary producers, causing shifts in the species composition and abundance of the entire estuarine community.

C. Policies

1. No discharge of primary or secondarily treated effluent into the critical areas of Hilton Head Island. This recommendation does not preclude the evaluation of ocean discharge or any other innovative technologies found to be acceptable by the South Carolina Coastal Council. In the event that an ocean discharge is found to be acceptable, the S. C. Coastal Council will consider the location of the discharge at the most appropriate location.

2. Any method of effluent disposal, other than land application on the island, will be evaluated on the basis of a comprehensive island-wide solution to the short and long term requirements of Hilton Head Island and the surrounding natural systems.

3. In view of the critical future potable water requirements for Hilton Head Island, and the fact that little information is now available concerning present use, quantity and quality of the existing ground water, the S. C. Coastal Council recommends that the appropriate parties undertake comprehensive studies to determine the quantity and quality of potable water resources for Hilton Head Island to accommodate future growth predictions.

II. The discharge of storm water runoff into the surface waters of Hilton Head Island.

A. ISSUE: The most serious existing threat to the surface water quality around Hilton Head Island is from storm water runoff or, as it is often referred to, nonpoint-source pollution. Without exception, the volume and substance of this discharge is a function of development, especially in a rapidly urbanizing area like Hilton Head Island. While general water quality on the island is not a major problem at this time, there are significant "trouble spots" on the Island. Assuming a continued growth pattern, these "spots" can be expected to broaden significantly and to begin a transition from short-term occurances to long-term or even permanent problems. Areas expected to receive the greatest impacts are Lawton Canal, Baynard Creek, the Folly, Fish Haul Creek and, most importantly, Broad Creek.

Given existing development guidelines these waters will likely face a reduced capacity to assimilate increased amounts of runoff and will likely meet only SB or, in some cases, SC water quality standards.

This situation would have serious implications for the shellfishing industry, the recreational use of wetland areas, and the natural environment which is an essential part of the atmosphere and ambience of Hilton Head Island. Certainly when the expected volumes of storm water runoff occur in combination with possible discharges of treated effluents, serious water quality issues will occur that may effect the public health, marine resources, public uses, and the economy of the area.

B. Existing Policies, Rules, Regulations, and "State of the Arts" Findings:

Coastal Management Plan (III-17, 1 d) Drainage plans and construction measures for residential development shall be designed so as to control erosion and sedimentation, water quality degradation, etc. Example techniques include buffering and filtering runoff, use of permeable paving surfaces, detention ponds, etc. Best management practices designed to control nonpoint-source runoff that are developed as part of 208 Water Quality Planning also apply to new housing projects.

Coastal Management Plan (III-22, 1 d) Care should be taken in design of roads to minimize direct drainage of roadway runoff into adjacent water bodies.

Coastal Management Plan (III-27, 1 b) Proposed parking facilities must demonstrate compliance with applicable Federal and state water quality standards, specifically those addressing drainage and discharge of storm water runoff.

Coastal Management Plan (III-40, 1 d) Drainage plans and construction for commercial development should be designed to lessen or eliminate erosion, water quality degradation and other negative impacts on adjacent waters - for example, filtering runoff, use of naturally vegetated buffers, etc. Best Management Practices developed as part of the area-wide 208 Water Quality Plan should be implemented through the management of major new commercial developments.

Coastal Management Plan (III-14) Guidelines for Evaluation of All Projects, 3) The extent to which the project will protect, maintain, or improve water quality.

Rule 30-12 (L)(2)(d) p. 44 To the extent feasible, the quantity and quality of any discharged waters shall not result in extensive alteration of the quality of coastal waters.

"State of the Arts" Concepts Reference: City of Charleston Discharge application into Wappoo Cut. EPA findings that pollutants are 20 times greater at the point of discharge than after filtering by a short expanse of marsh.

Reference: 208 Water Quality Study for Hilton Head Island. Stormwater has already lowered the quality of Point Comfort Creek, Lawton Creek and Broad Creek. Fish Haul, Jarvis, Old House, and the Folly are experiencing occurances of high coliform counts.

If development on Hilton Head Island continues as it has, water quality will deteriorate, the local shellfishing areas will close, and more sensitive publicly owned areas will be damaged as a result of private economic conditions.

Wetlands and marshes perform a valuable role in storm water run off control and pollutant removal from runoff.

C. Policies

1. The direct discharge of untreated storm water runoff into the critical area (as defined by the S.C. Coastal Zone Management Act) shall not be allowed.

2. The South Carolina Coastal Council shall utilize "Best Management Practices", such as those identified in the Hilton Head Island 208 Water Quality Study, in the review and issuance of permits and certifications. The "Best Management Practices" will be applied on a project by project basis as warranted by specific requirements. (See Appendix A.)

3. Optimum utilization of marshes and freshwater wetlands for filtering storm water runoff should be required.

4. Drainage projects shall be designed so that the final elevation of a storm water discharge outlet is at or above the elevation of the receiving critical area, unless no feasible alternatives exist.

5. An SA, or better, water quality classification shall be maintained or achieved in surface waters surrounding Hilton Head Island.

6. It is recommended that the South Carolina Department of Health and Environmental Control (DHEC) consider regulating specific point source discharges of storm water via the National Pollutant Discharge Elimination System (NPDES).

CHAPTER THREE

Tidal Wetlands

The damage to tidal wetland areas as a result of dredging, filling, and spoil disposal; construction of water access facilities (including marinas); and the discharge of treated effluent and non-point source pollutants.

A. ISSUE: Due to the rapid and continuous development taking place on Hilton Head Island, pressure exists for filling, dredging, spoil disposal, construction of water access facilities and the discharge of treated effluent and non-point source pollutants. While protection against most direct adverse impacts is afforded tidal wetlands through the permitting systems of the Coastal Council and the U.S. Army Corps of Engineers, significant pressures to alter these areas will continue during the known planned phase of development and through projected build-out. Pressures for filling of wetlands will be strongest during the build-out phase due to the fact that the remaining areas left for development will be areas such as isolated marsh hammocks to which vehicular access can be gained only by filling or bridging. Water access to these sites will also cause increased applications for dredging activities and their accompanying spoil disposal sites. The deepening of creeks through dredging will, in many cases, result in siltation problems and the need for periodic maintenance dredging. Developers are finding it difficult to provide highland spoil disposal sites, and it is certain that pressure to use non-vegetated wetlands (mudflats and non-vegetated creek edges) as disposal sites will occur during future phases of development.

A tremendous pressure is beginning and will continue to be felt for the construction of marinas. A trend toward lock system/basin type marinas is beginning to appear. The results of this phenomenon will be greater access to the water for boaters and home owners accompanied by very serious potential water quality problems within the basins and adjacent natural creeks into which they empty.

At this time there appears to be no overriding justification for the basin type marina in terms of improving the functions associated with boat storage. Staff assumptions are that the scarcity of large tracts of waterfront property and the desire for additional waterfront development sites are the prime motives for this shift from the more traditional approaches to marina developments.

A direct impact of marina development is the closure of shellfish grounds within 1000 feet of the site as a precautionary measure. Current development trends suggest a demand for approximately 10 more marinas on Hilton Head Island. That situation combined with water quality problems associated with storm water runoff and wastewater discharges could eliminate shellfish grounds as a resource for public consumption. Broad, Old House, Jarvis and Skull Creeks are the most likely areas of impact. What kind of balance can be obtained between the demand for marinas and the shellfish resource? It is predictable that the resource will be eliminated as a direct result of competing uses that carry more economic weight.

The discharge of treated effluent into surface waters is and will continue to be a major issue on Hilton Head Island. It is difficult at best to reach a scientifically determined limit at or below which the wetlands will not experience adverse effects. A preliminary draft EIS addressing this problem suggests three alternatives for disposal of treated effluent, two being land application and the third being discharge into Calibogue Sound. However, this study is not addressed to the island-wide problem but to the needs of the Sea Pines PSD only. The inevitable increasing demands for discharge from other sections of the island could lead to tremendous water quality problems which will leave their effects on living marine resources.

The most serious threat to tidal wetlands from present and pending development has been identified as that of water quality degradation due to storm water runoff (i.e., storm water which cannot seep naturally into the ground during rainfall due to the land surface being covered by buildings, roads, highways, parking lots and other impermeable surfaces). This runoff picks up many types of bacteria, chemicals, heavy metals and other toxic materials which are then carried by the water into the tidal creeks and estuaries. With each new development the amount of storm water runoff increases and exacerbates the problem of water quality degradation in the surface waters around the island. (See Water Quality for further discussion.)

B. Existing Policies, Rules, Regulations, and "State of the Arts" Findings:

General

Coastal Management Program (III-14,15) These "Guidelines for Evaluation of all Projects" should be used, without exception, in each permit application decision. They are most valuable in helping decision-makers view projects from a broad and comprehensive perspective.

Discharge of Treated Effluent

Coastal Management Program (III-37, 1 e) Discharge of water used to pump out holds of fishing vessels must comply with DHEC and Coast Guard regulations.

Coastal Management Program (III-41, 1 e) Adequate sewage disposal systems must be provided by new commercial development.

Coastal Management Program (III-46, 1 e) Proper handling of sewage must be made in new marinas.

Coastal Management Program (III-61, 1 d) "Sewage treatment facilities shall be constructed to limit effluent discharge as much as possible into areas containing productive shellfish beds. Construction of facilities shall in no case degrade the existing water quality classification of the receiving water body and if the current classification is not the highest achievable, the plans shall show a consideration for the water body ultimately achieving the highest classification."

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Coastal Management Program (III-61, 1 e) "Outfall locations should consider water depth, circulation and mixing in order to protect water quality. Effluent should not be discharged into poorly confined or poorly flushed estuarine areas."

Coastal Management Plan (III-71, 4) Extension of public services (e.g., sewer facilities) to barrier islands should only be proposed in a comprehensive approach considering natural "carrying capacity" of the island.

Rule 30-12 (E) (4) (h) p. 34 Marina proposals shall include facilities for the proper handling of sewage.

Rule 30-12 (L) (2) (d) p. 44 To extent feasible, quantity and quality of any waters discharged from drainage canals or ditches shall not extensively alter wetlands or the quality of coastal waters.

Non-point Source Pollutants

Coastal Management Plan (III-17, 1 d) Drainage plans and construction measures for residential development shall be designed to control erosion, sedimentation, and water quality degradation on adjacent water and wetlands. (Techniques to prevent direct storm water discharge are suggested.)

Coastal Management Plan (III-22, 1 d) "Care should be taken in design of roads to minimize direct drainage of roadway runoff into adjacent water bodies."

Coastal Management Plan (III-22, 1 f) In construction of private roadways for private access permeable surfaces should be used rather than pavement.

Coastal Management Plan (III-27, 1 b) Proposed parking facilities must demonstrate compliance with water quality standards concerning drainage and discharge of storm water runoff.

Coastal Management Plan (III-37, 1 a) Drainage from any proposed seafood processing operations must meet applicable water quality standards.

Coastal Management Plan (III-43, 1 c ii) Park plans must incorporate maximum use of permeable surfaces where appropriate.

Coastal Management Plan (III-44, 1 c) The use of construction methods which minimize degradation of water quality from erosion or storm water drainage are strongly encouraged for commercial recreation facilities.

Rule 30-12 (E) (4) (h) p. 35 Where feasible, boat maintenance areasmust be designed for control of storm water runoff.

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Water Access Facilities
(marinas, boat ramps, docks and piers)

Coastal Management Plan (III-46, 1) (Marinas)
"a) To the extent feasible marinas shall locate only in areas that will have the least adverse impact on salt, brackish or freshwater wetlands and water quality.
b) To the extent feasible marinas shall be located in areas where maximum physical advantage exists and where the least initial and maintenance dredging will be required.
c) Marinas should avoid or minimize the disruption of currents. Dead-end or deep canals without adequate circulation or tidal flushing will not be permitted unless it can be determined that water quality will not be adversely affected.
d) Marina designs should minimize the need for excavation and filling of shoreline areas.
e) Provision of facilities for the proper handling of petroleum products, sewage, litter, waste and other refuse must be made in new marinas, with regard to South Carolina Department of Health and Environmental Control (DHEC) specifications.
f) In review and certification of marina permit applications outside the critical areas, the Coucil will consider th extent of public demand for the facilities, as demonstrated by the applicant."

Rule 30-12 (E) p. 52-53 (Marinas)
"(2) Commercial docks are also considered a marina type facility. The standards that apply to marinas will also be used as criteria in the evaluation of permit applications for commercial docks.
(3) All marinas affect aquatic habitats to some degree, but adverse effects can be minimized by utilizing proper location and design features. Application for marinas shall include a comprehensive site plan showing location and number of all water-dependent and upland facilities such as parking and storage facilities.
(4) In addition to standards for bulkheads and seawalls, docks and piers, dredging and filling, and navigation channels and access canals, the following standards are applicable:

a) Marinas should be located in areas that will have minimal adverse impact on wetlands, water quality, wildlife and marine resources, or other critical habitats;
b) Where marina construction would affect shellfish areas, the Council must consider the rights of the lessee, if applicable, and the public, and any possible detrimental impacts on shellfish resources;
c) Marinas should be located in areas where maximum physical advantages exist and where the least initial and maintenance dredging will be required;
d) Marinas must avoid or minimize the disruption of currents. Dead-end or deep canals without adequate circulation or tidal flushing will not be permitted unless it can be demonstrated that water quality will not be adversely affected;
e) Marina design must minimize the need for the excavation and filling of shoreline areas;
f) Open dockage extending to deep water is usually preferable to excavation for boat basins, and it must be considered as an alternative to dredging and bulkheading for marinas;

g) Turning basins and navigation channels shall be designed to prevent long-term degradation of water quality. In areas where there is poor water circulation, the depth of boat basins and access canals should not exceed that of the receiving body of water to protect water quality.

Where feasible, boat maintenance areas must be designed so that all bottom scraping and painting be accomplished over dry land allowing for proper control and deposition of residues, spills and storm water runoff;

i) Dry storage type marinas are preferred, wherever feasible;
j) Applications for construction of marina and commercial dock facilities will be considered by the Council only after adequate demonstration by the applicant of demand for the facilities;
k) Applications for marinas must include maintenance dredging schedules and dredged material disposal sites when applicable."

Coastal Management Plan (III-48, 1) (Boat Ramps)

1) In the coastal zone Council review and certification of applications for boat ramps will be based on the following policies:

a) Filling of productive salt, brackish, or freshwater wetlands for boat ramp construction is prohibited unless no feasible alternatives exist in adjacent non-wetland areas. In addition, the amount of fill required must be minimized.
b) The following priorities are considered when justifying boat ramp location in sensitive areas:
    i) public use - open to all citizens,
    ii) restricted use - open only to citizens of a particular area or organization,
    iii) private use.
c) Boat ramp locations requiring dredging of productive salt, brackish or freshwater wetlands to provide channel access to deep-water will be discouraged.
d) Boat ramps must be constructed of environmentally acceptable materials.

Rule 30-12 (B) pp. 29-30 (Boat Ramps)

1) Boat ramps provide access to the water for those who do not have water access by means of docks, piers, or marinas. However, boat ramp construction may require filling or, in some cases, dredging of wetland areas.

2) Specific standards which shall apply are as follows:

a) Filling of vegetated wetlands for boat ramp construction is prohibited unless no feasible alternatives exist in non-vegetated wetland areas. In addition, the area to be filled must be limited to that which is reasonable for the intended use;
c) Justification for boat ramp construction in environmentally sensitive areas shall be considered using the following priorities:
    i) public use - open to all citizens;
    ii) restricted use - open to citizens of a particular area or organization only;
    iii) private use - use for one citizen or family;

d) In cases where private use is necessary, siting of ramps must, wherever feasible, be located in areas where the least environmental impact will accrue to the area;
e) Boat ramp location requiring dredging or filling of wetlands to provide deepwater access to the ramp, parking areas for the ramp, or other associated facilities are prohibited unless no feasible alternatives exist and environmental impacts can be minimized;
f) The siting of "public use" boat ramps is encouraged in easily accessible areas such as bridges and exisitng, abandoned causeways, provided that these sites comply with other applicable regulations.

Rule 30-12 (A) pp. 28-29 (Docks and Piers)
g) Dry storage in uplands will be encouraged in preference to moorage in crowded areas;
h) Developers of subdivisions, motels, and multiple family dwellings will be encouraged to develop joint-use moorage facilities while their plans are in the development stage;
j) Where docks and piers are to be constructed over tidelands utilized for shellfish culture or other mariculture activity, the Council will consider the rights of the lessee and the public prior to approval or denial.

Dredging, Filling and Spoil Disposal

Coastal Management Plan (III-55, 1) (Dredging)
"a) To the extent feasible dredging should be performed only during closed shellfishing season if proposed in a productive shellfish area.
b) Suspended sediments must be kept to a minimum. The use of structures such as weirs and silt curtains to minimize water quality degradation is encouraged. Where highly toxic sediments are encountered, dredging will be prohibited unless the activity is consistent with other dredging policies, as well as those for manufacturing or other industrial activities.
c) Dredging should not reduce water circulation, water currents, mixing, flushing or salinity in the immediate area.
d) Dredging for establishment of new canals which involves permanent alteration of valuable wetland habitats will be prohibited unless no feasible alternative exists or an overwhelming public interest can be demonstrated. Establishment of canals for purposes of creating waterfront lots from inland property, especially where dead-end canals would result, will be prohibited unless it can be demonstrated that there will be no significant environmental impacts."

Rule 30-12 (G) p. 37-38 (Dredging and Filling)
"a) The creation of commercial and residential lots strictly for private gain is not a legitimate justification for the filling of wetlands. Permit applications for the filling of wetlands and submerged lands for these purposes shall be denied, except for erosion control, see R.30-12(C), or boat ramps, see R.30-12(B). All other dredge and fill activities not in the public interest will be discouraged;

b) Dredging and filling in wetland areas shall be undertaken only if the proposed activity is water-dependent and there are no feasible alternatives;
c) To the maximum extent feasible, dredging and filling activities should be restricted in nursery areas and shellfish grounds and during periods of migration, spawning, and early development of important sport and commercial species;
d) Dredging and excavation shall not create stagnant water conditions, lethal fish entrapments, or deposit sumps or otherwise contribute to water quality degradation;
e) Designs for dredging and excavation projects shall, where feasible, include protective measures such as silt curtains, diapers, and weirs to protect water quality to adjacent areas during construction by preventing the dispersal of silt material;
f) Dredged materials shall be deposited and contained in such a manner so as to prevent dispersal into adjacent wetland areas;
g) Applications for dredging in submerged and wetland areas for purposes other than access, navigation, mining, or drainage shall be denied, unless an overriding public interest can be demonstrated. Dredging permits for mining will be issued only as specified in (2) (h) below. Drainage permits must be consistent with the provisions in R.30-12(L);
i) Wetlands shall not be utilized as depositories for waste materials except as discussed in R.30-12(I);
j) In all cases, dredging activities shall not be approved until satisfactory disposal sites have been acquired."

Coastal Management Plan
(Filling)

Coastal Management Plan (III-16, 1 b) Residential development which would require filling of wetlands will be prohibited, unless no feasible alternatives exist or an overriding public interest can be demonstrated, and any substantial environmental damage can be minimized.

Coastal Management Plan (III-22, 1 a) Where wetlands cannot be avoided, bridging rather than filling will be required wherever feasible.

Coastal Management Plan
(Spoil Disposal)

Coastal Management Plan (III-57, 1) (Dredged Material Disposal)
"a) To the maximum extent feasible, dredged material must not be placed on high value natural habitats such as salt, brackish or freshwater wetlands; submerged vegetaion; oyster reefs or tidal guts. Where upland disposal is not possible, areas of relatively low productivity should be utilized, or ocean disposal should be employed.
b) Upland dredge material disposal sites must be stabilized and maintained where necessary to prevent erosion and direct water run-off.

c) Where water disposal is necessary, natural channels must not be blocked with dredged material and impact on existing water circulation should be minimized. Depostion in water areas of higher flushing rate will decrease damage from suspended sediment and oxygen depletion.
d) Consideration must be given to the temporal aspects of spoil deposition such as impacts on spawning seasons, fish migrations, waterfowl nesting and wintering areas, and mosquito control.
e) The selection of upland dredge disposal sites should include consideration for minimizing negative impact on valuable terrestrial wildlife or vegetative habitats."

Rule 30-12 (F)(2)(b) p. 35: The location and design of public and private transportation projects must avoid the critical areas to the maximum extent feasible. Where coastal waters and tidelands cannot be avoided, bridging rather than filling of these areas will be required to the maximum extent feasible.

Rule 30-12 (I) pp. 40-41 (Deposition of Dredged Material)
"a) Upland disposal of dredged material shall always be sought in preference to disposal in wetlands. Vegetated wetlands and mudflats shall not be utilized for disposal of dredged materials unless there are no feasible alternatives. Any other wetlands should not be utilized for disposal of dredged materials when other alternatives exist;
b) Open water and deep water disposal should be considered as an alternative if highland alternatives are not feasible. However, open and deep water disposal sites should be seriously considered only after careful consultation with the Council and other relevant state and federal agencies;
g) Consideration must be given to the temporal aspects of spoil deposition -- for example, impacts on spawning, fish migrations, shellfish harvesting, waterfowl nesting and wintering areas, and mosquito control. Attention must be given to possible adverse impacts of various alternative sites on the public health and welfare as well as on critical fish and wildlife areas;
h) In all cases, dredging activities shall not be approved until satisfactory disposal sites have been acquired."

C. Policies

1. The South Carolina Coastal Council will continue to strictly enforce its existing policies, rules and regulations affecting the critical areas of Hilton Head Island and their use. The Council will also review the cumulative impacts of proposed projects more closely.

2. The S. C. Coastal Council discourages the development of marsh hummocks around Hilton Head Island, as identified in the Hilton Head Island Marsh Hummock Inventory. The Coastal Council will continue to strictly enforce policies, rules and regulations governing access to these areas.

3. The S. C. Coastal Council discourages the closure of any productive shellfish areas around Hilton Head Island. The following recommendations will be implemented on Hilton Head Island.

   A. Applications for marinas and other activities which would cause the closure of productive shellfish areas are encouraged to locate those activities in areas presently closed.

   B. No project which will cause the closure of shellfish grounds designated as being the most productive by the Hilton Head Island Shellfish Inventory should be approved.

   C. Applicants for permitted projects which would cause the closure of shellfish grounds in less significant areas as identified by the Hilton Head Island Shellfish Inventory shall be required to submit a mitigation plan for the loss of resources to the S. C. Coastal Council, the South Carolina Wildlife and Marine Resources Department and the South Carolina Department of Health and Environmental Control.

4. Excavated, basin-type marinas should not be permitted unless the project sponsor can demonstrate, to the satisfaction of the S. C. Coastal Council, that the water quality of adjacent or contiguous wetland areas will not be degraded, and can demonstrate the long term operating viability of any mechanism or process designed to maintain water quality within the basin.

5. Marinas should be located in areas that possess the physical characteristics necessary for the function of boating activities associated with marinas. Significant alteration of the critical area in order to create a more favorable physical location for marinas and other similar activities should be prohibited.

CHAPTER FOUR

Freshwater Wetlands

I. The development and building on Hilton Head Island has resulted in a number of changes to the natural systems present on the island. These have included the alteration and reshaping of historic drainage patterns and land forms, the creation of artificial lagoons and reservoirs, and the indiscriminate dredging and filling of the Island's freshwater wetlands.

A. ISSUES: These activities have contributed to the elimination of approximately 33% of all freshwater wetlands on the island. Moreover, an additional 20% have been significantly changed by developmental activities occurring on their periphery, which have resulted in an alteration of the natural patterns which initially created the wetlands.

The consequences of this continuing trend will be:

1. A loss of wildlife habitat diversity. The loss of wildlife habitat could result in the elimination of many types of animals on the island. As natural habitat is lost, the diversity of the animal population will decline resulting in the elimination of the natural wildlife population.

2. The loss of areas which have historically been the receiving point for the collection of storm water runoff and flood events. As more and more of the island is developed, and undeveloped lands are replaced by impermeable surfaces, the volume and substance of runoff water increases. Freshwater wetlands typically are physical depressions or low spots which collect and hold most runoff. Retained water is gradually absorbed or filtered back into the ground or surface waters. Until recently these wetlands have been set aside from development because of the availability of other land and the increased costs associated with dredging and filling them to make the property acceptable for building. Competition for space on the island has changed that. Present trends indicate that these wetlands are being rapidly developed and removed from the system. Runoff storm water is instead moved through a system of ditches and drainage pipes as rapidly as possible to its discharge point. These systems are designed and "sized" to accommodate a specific storm event. Any storm larger than the designed storm will result in water coming out of the ditch and flooding the adjacent area. Prior to development the wetlands were the point where these storm events were absorbed.

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3. Reduced natural capacity to treat and filter pollutants from storm water. An important function associated with the collection of storm water runoff in wetlands is the treatment capacity of these areas. Storm water is generally thought of as being pure clean rain water. However, a number of pollutants are usually found in any urban environment, and with rain as a vehicle of movement, they will be collected and transported downstream. Pollutants include such things as street litter; seepage and spillage from garbage cans; stagnant water; carwashings; fuel and chemical spillage; fertilizers and pesticide from yards and golf courses; vehicle drippings - gas, oils, brake fluids; commercial and industrial contaminants; dirt and debris washing from construction sites; mosquito control chemicals from aerial spraying programs; seepage from improperly functioning septic tanks or privies; animal droppings, and dead animals. The accumulation of all of these different pollutants in a single area such as a ditch, pipe, or low area can result in profiles very similar to raw untreated domestic sewage. Surveys of storm water and raw sewage in localities throughout the country have shown the constituent levels, such as coliform bacteria, nutrients, chlorides and miscellaneous substances to be comparable in each case. The sampling information conducted as part of the 208 water quality program on Hilton Head Island has likewise shown high levels of pollutants at several of the sampling stations.

   The management of storm water runoff requires that a coordinated approach be used to address the problem. A number of different measures must be used if a successful program is to be implemented. Best Management Practices generally involve holding water on site for periods of time with a gradual release downstream, a reduction in the amount of pavement and impermeable surfaces, maintenance of vegetated open spaces and natural absorption areas, and good housekeeping to reduce the introduction of pollutants into the systems. Because freshwater wetlands perform a cleaning function in the natural environment, their abilities to hold and filter limited amounts of storm water increase the importance of their preservation. The amount of water which can be accommodated by each wetland must, of course, be addressed in the engineering and design phases of each project proposed for construction.

4. Loss of aquifer recharge areas. It is highly probable that some of the freshwater wetlands on Hilton Head Island are recharge points for the shallow water aquifer and possibly for the deepwater aquifer as well. A site survey is required to identify these points and verify that an aquifer recharge is in fact occuring. The South Carolina Water Resources Commission, during the next year, will be making surveys of many of these wetlands to identify where these points are located. The elimination of aquifer recharge points can have serious consequences for the island. A failure to recharge the shallow water aquifer can result in a freshwater draw-down and contamination of the aquifer by salt water intrusion.

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This could affect the limited number of people who use shallow wells for drinking water as well as the number of shallow wells used for irrigation purposes. Contamination of the deep water aquifer would affect the total population of the island.

The freshwater wetlands of the island can be broadly classified into four categories. These are: forested (with a closed canopy), forested (with an open canopy), nonforested, and the open water community.

The forested (closed canopy) category is made up of a number of tree communities generally containing swamp tupelo, sweetgum, red maple, palmetto, and pond cypress trees.

The forested (with an open canopy) group contains a mixture of trees and plants dominated by pond cypress, pond pine, palmetto, tallow trees, marsh, saw grass, foxtail and cattails.

The nonforested category contains freshwater marsh groups. Prevalent plants found in this category are marsh, fern marsh, Virginia chain fern, saw grass, and cattails.

Open water freshwater wetland communities are the floating aquatic community found in standing water dominated by water lilies and mosquito ferns, and the pickeral weed community.

The most commonly found forested wetland on the island is the swamp-tupelo community which predominates the deep wetlands characteristic of the northern end of the island. The swamp-tupelo, sweet gum, red maple communites although not as dominant as the swamp-tupelo group occupy more total area than any other community. These types of wetlands are found in the broad, linear wetland northwest of Broad Creek. They often run for more than half a mile in length.

Fernmarsh and maidencane marshes are the most common of the freshwater marshes. The greatest total single area is the Virginia chain fern, mixed marsh (Wooping Crane Conserancy and others).

Preliminary investigations provide evidence that most of the remaining wetlands on Hilton Head Island are 404 Wetlands as defined by the U.S. Corps of Engineers. However, due to land development, few 404 wetlands larger than 10 acres still exist on the island. It is left to the discretion of the District Engineer of the U.S. Corps of Engineers whether or not to allow certain alterations to 404 wetlands less than 10 acres in size.

B. Existing Policies, Rules, Regulations, and "State of the Arts" Findings:

Coastal Management Plan (III-16, 1 b) Residential Development "Residential Development which would require the filling or other permanent alteration of salt, brackish or freshwater wetlands will be denied unless no feasible alteratives exist or an overriding public interest can be demonstrated."

Coastal Management Plan (III-22, 1 a,b,f) Transportation Road and highway routes should be designed to avoid salt, brackish, or freshwater wetlands. No substantial changes in water circulation. Private access ways should be designed to avoid salt, brackish, or freshwater wetlands.

Coastal Management Plan (III-25, 1 a)
Railways should be designed to avoid salt, brackish or freshwater wetlands.

Coastal Management Plan (III-27, 1 a) Parking facilities The filling or other permanent alteration of productive, salt, brackish, or freshwater wetlands will be prohibited unless no feasible alternative exists, the facility is directly related to a water-dependent activity, any substantial environmental impacts will be minimized, and an overriding public interest can be demonstrated.

Coastal Management Plan (III-40, 1 a) Commercial Development Commercial Development that requires the filling or other permanent alteration of salt, brackish, or freshwater wetlands will be denied unless no feasible alternatives exist and the facility is water-dependant.

Coastal Management Plan (III-73) Wetlands (outside of critical areas)
"Project proposals which would require fill or other significant permanent alteration of a productive freshwater marsh will not be approved unless no feasible alternative exist or an overriding public interest can be demonstrated, and any substantial environmental impact can be minimized."

Other Management Plan Policies (III-31, Forestry, 1-b, 1-c; III-32, Mining, 1-b, 1-c; III-34, Manufacturing, 1-b, 1-c; III-36, Fish and Seafood Processing, 1-c; III-38, Aquaculture, 1-a; III-43, Recreation and Tourism, 1-b, 1-d; III-46, Marinas, 1-a; III-48, Docks & Piers; III-53, Impoundments, 1-a, 1-b; III-55, Dredging, 1-d; III-57, Dredged Material Disposal, 1-a.)

C. Policies

1. The staff of the South Carolina Coastal Council, with the assistance of other state and federal agencies, will complete comprehensive site visits to those wetlands identified by the Freshwater Wetlands Inventory for Hilton Head Island. Designation as a 404 Wetland by the U.S. Army Corps of Engineers will provide the primary basis for investigation and designation as valuable natural resource areas. Those areas designated as being valuable to the natural systems of Hilton Head Island should be protected from detrimental alteration.

2. Storm water runoff should be directed into natural drainage routes and freshwater wetlands, but should not exceed the assimilative capacities of those areas.

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CHAPTER FIVE

Beaches and Dunes

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I. Many broad areas of the beachfront of Hilton Head Island are experiencing erosion. The areas most prone to erosion are North Forest Beach, Palmetto Dunes, the Folly Inlet and the extreme tips of the island.

A. ISSUE: With the exception of the tips of the islands, where erosion is thought to result from the currents moving in and out of the two sounds, most of the erosion is taking place on the protruding "bump". It is thought that this bump could be the sand supply source for the island and consequently could account for the increased erosion rate. Most development which has occurred over the last few years was set back well beyond the mean high water mark and primary oceanfront sand dunes. (In some instances houses have been set back beyond the third line of dunes, and over 225 feet in the case of North Forest Beach.) More recently, a trend of increased density and maximization of the oceanfront lots has resulted in building to the edge of the set back line. These types of projects have typically shown little regard for erosion trends and have proceeded to remove existing secondary dunes and the maritime forests that provide sand to the beach system and afford some degree of storm protection.

The erosion protection measures on Hilton Head Island have been extensive. Presently, most of the area from the Folly Inlet to North Forest Beach, except for Palmetto Dunes, has to be continuously renourished and much of it is either protected by a seawall, revetment, groin field, or, in many instances, with both armouring and groin fields. Additionally, two renourishment projects have occurred in the last ten years in one area. It is not known whether the erosion will continue. The pattern could reverse, and the beachfront could begin accreting tomorrow. Forecasting the erosion rate is very similar to forecasting the weather years in advance; too many factors come into play which can affect the accuracy of these predictions. However, at least three studies dealing specifically with the beachfront erosion of Hilton Head Island have been conducted in the last ten years, and a lot of information has been collected and analyzed. It is suspected that the armouring of the shoreline during the last 20 years has resulted in an increase in size or spread of the area subject to erosion. Permit applications for erosion control structures granted over the last few years support this belief. Based upon the information available it was assumed that the erosion rates similar to those experienced in past years will continue. It is upon this assumption that these policy issues and recommendations have been prepared.

The substantial issues involved in the question of protection of oceanfront property on the island are:

1. The Council's present policy in approving erosion control structures is to review each on a case-by-case basis and to approve each application on its own merits.

Based upon this existing policy, should the present system of permitting individual structures be continued or should a standard design approach - whether it be renourishment, seawall or revetment - be selected and all future projects designed to conform to those specifications?

2. The Council's present policy is to allow no backfilling in areas where land has been lost to erosion. Should the Council allow backfilling behind bulkheads, (in areas where adjoining bulkheads have been constructed), in order to maintain a continuous line, which studies have indicated is usually more effective in reflecting water? If this is allowed should the use of the area be restricted with a setback line?

3. The Council presently does not enforce any type of setback requirement behind the primary oceanfront sand dune or point of highest wave uprush. Development of property which is presently not subject to erosion has, in many instances, removed the secondary dunes and maritime forests which could provide some type of protection in the event of unusual weather. Should a setback line and buffer requirement to protect secondary dunes and maritime forest areas be adopted by the Council?

4. There is a documented need for increased information on erosion patterns and the natural systems of the beachfront all along the coast. A program to take periodic measurements along the island's coast could be beneficial to the Council staff, and to scientists, engineers, and developers. The anticipated program could be conducted with existing staff and photography. Increased costs could be expected to be minimal.

5. The inlets of tidal creeks are known to be highly unstable areas. Development pressures will inevitably result in requests to develop the land around these inlets. The Council could allow development to occur even though the present regulations will not be effective in protecting the property from erosion, sudden flooding, or other events. Should an increased setback be required?

6. A program to better manage primary and secondary dune systems remaining after development would be helpful to the beachfront. It has been recommended that some sort of dune enhancement program be prepared and implemented.

B. Existing Policies, Rules, Regulations, and "State of the Arts" Findings:

Coastal Management Plan Residential Development 2(c), Parking Facilities 2(b), Manufacturing 2(b), Commercial Development 2(b), Public Buildings 2(b) . . . The siting of nonwater-dependent structures on the primary dunes or beaches will be discouraged where other feasible alternatives exist. Design and construction options which minimize destruction of the dunes and dune vegetation will be encouraged.

Coastal Management Plan Dredged material disposal
2 (a) Upland disposal or dredged material should always be sought in preference to disposal in wetlands.

Coastal Management Plan Dune Areas (other than critical areas)
"1) Because of their proximity to and strong physical and ecological relationship with beach and primary sand dune critical areas. . ., project proposals in secondary sand dunes must demonstrate reasonable precautions to prevent or limit any direct negative impacts on the adjacent critical areas.

2) Special attention must be given in new construction activities in oceanfront areas to prevent or mitigate negative impacts on adjacent property owners, specifically, increased erosion or loss of protective dune formations on adjacent lots due to unnecessary destruction of or encroachment onto stable dunes."

Coastal Management Plan Erosion Control Policies (IV-57)
"1) Seawalls, bulkheads and revetments will be considered only as part of a comprehensive erosion control program to insure that these structures do not cause adverse effects to adjoining property owners or appreciably accelerate erosion in the general beach area.

2). . . structures must not interfere with existing or planned public access. . .

3) . . . structures shall not impede public use of beaches below the mean high water line. . .

5) Applications for construction of a seawall in the beach or dune critical areas for the purpose of filling behind these structures to create land for private development shall be denied unless the applicant can clearly demonstrate to the Council that no feasible alternatives exist . . .

6) Except under special circumstances, such as critically eroding shorelines that have a direct measureable effect on the economic well-being of an applicant or are a threat to the public safety, the Council will promote the use of natural features of the dune and beach system rather than artificial protection . . ."

Groins

"4) The positive effect and applicability of a groin system in a comprehensive shore protection program must be demonstrated."

Artificial Beach Nourishment

1) A thorough study must be prepared before renourishment is attempted.

2) Fill material should not come from dune fields, adjoining beaches or nearshore bars.

Sand Dune Management

"1) Private and public projects to restore and stabilize dunes through non-structural means are encouraged.

2) To the extent possible, the secondary dunes should be kept in tact to insure protection of adjoining areas against flooding during storms.

3) Buffer areas should be established, where feasible, to allow for frontal dune growth and movement.

6) Walkover structures are encouraged over all frontal dunes. However, these walkover structures should not interfere with public access or extend below the mean high water line.

9) In all cases, the primary front-row sand dune, as defined in R.30-10(B), should not be permanently altered."

Rules and Regulations

Rule 30-13 Specific Project Standards for Beaches and Dunes.
"b) The Council will promote the use of natural features of the beach and dune system rather than artificial protection,
c) The Council will consider the extent to which the project is consistent with a comprehensive shore protection program for that particular stretch of beach,
d) Erosion control structures must not interfere with existing or planned public access unless other adequate access can be provided,
f) All erosion control projects must consist of environmentally acceptable materials, demonstrate sound design and construction so that they could reasonably be expected to be safe and effective, and minimize adverse effects to the beach . . .
g) Erosion control strucures should not normally be approved except when erosion imminently threatens permanent improvements, including but not limited to buildings, paved parking lots, swimming pools, etc., which existed on the subject property 90 days after adoption of this regulation; or, in the case of protecting property adjacent to existing erosion control structures; or, in the case of structures specifically called for in an approved erosion control plan."

2) Specific standards for seawalls, bulkheads and revetments.
3) Standards for groins and jetties.
4) Requirements for artificial beach nourishment.

Sand Dune Management

1. Requirements for walkways over dunes.
2. Projects to restore or build new dunes.

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Nonwater-dependent structures . . .

The siting of nonwater dependent structures on or over the primary sand dunes and beaches will be prohibited where other feasible alternaties exist.

C. Policies

1. The S. C. Coastal Council will coordinate with development interests to establish a beach monitoring program for the purpose of understanding erosion rates and trends on Hilton Head Island.

2. The South Carolina Coastal Council shall emphasize the use of non-structural solutions to erosion on Hilton Head Island.

3. Erosion control structures should not normally be approved except when erosion imminently threatens permanent improvements including but not limited to buildings, paved parking lots, etc.

4. Developers are urged to assess the erosional history of project areas and to setback their development beyond the jurisdiction of the Coastal Council where appropriate.

CHAPTER SIX

Public Access

I. Public Access to the Coastal Resources on Hilton Head Island.

A. ISSUE: The natural resources of Hilton Head Island provide a variety of recreational activities for the entire public. The more obvious include swimming, fishing, shellfish harvesting, boating, hiking, and observation of wildlife.

Several issues have developed in recent years concerning the appropriate use of these resource areas. Predicted urbanization will only compound these problems.

First, while there is an abundance of recreational areas, access to these areas is usually controlled by private ownership, thus limiting the use of primary areas to a select public. This is a particular problem for access to beach areas. Currently there are only two public beach access points, with approximately two hundred parking spaces, on Hilton Head Island. It poses a significant problem for the existing population. Second, like beach access, private ownership and a lack of funds has limited public access opportunities to boat landings. With the growing trend toward the small trailerable boat, the single public landing on Hilton Head Island will not meet the public's demand in future years. In fact, facilities that allow a user fee will likely become totally private in order to accommodate membership demand. Third, the construction and location of marinas are already indicating an adverse impact on many inland fishing drops on Hilton Head Island. This trend will likely continue should a prediction of ten additional marinas prove accurate. Fourth, and most important, is the rapid growth factor. Simply, there is a much greater current demand for access to recreational areas than supply. As the interior portion of the island, which possess no natural access to water courses, develops a tremendous burden will be placed upon existing supply. Development interests should note that even the more affluent island residents will find themselves disenfranchised of the privilege to utilize public recreational resources.

B. Existing Policies. Rules, Regulations, and "State of the Arts" Findings:

Coastal Management Plan (III-14, Guidelines for Evaluation) 13) "To protect and, where possible, to restore or enhance the resources of the State's coastal zone for this and succeeding generations."

Coastal Management Plan (III-14, 7) "The possible long-range, cumulative effects of the project, when reviewed in the context of other possible development and the general character of the area."

Coastal Management Plan (III-14, 9ii) "Public recreational lands - conversion of these lands to other uses without adequate replacement or compensation, interruption of existing public access, or degradation of environmental quality in these areas," Coastal Management Plan (III-17, 3 B) Developers are encouraged to incorporate common use recreational areas in proposals for large-scale residential developments.

Coastal Management Plan (IV-64, 1) The Coastal Council fully endorses and will support, further, and encourage the protection of and the expansion of public access to shoreline areas in South Carolina.

Coastal Management Plan (IV-64, 8) The provision of additional parking space in upland areas adjacent to beaches should be a priority for recreational planning by both local and state agencies.

9) Local governments in the coastal zone are urged to incorporate considerations for provision of public access into their local ordinances and comprehensive plans, especially in subdivision regulations which can influence the locaton and design of the new development that might affect public access.

10) Private developers in beach areas are encouraged to include provision of reasonable public beach areas and access ways in their plans.

12) The Council advocates the provision of joint use docks, boat ramps, etc.

13) The Council recognizes the overriding importance of good water quality as a recreational resource, and will strive to maintain, and improve, existing standards.

C. Policies

1. The South Carolina Coastal Council should not approve any project or permit which would cause the net loss of any existing public beach access.

2. The S. C. Coastal Council, the S. C. Department of Parks, Recreation and Tourism, the local governnment and development interests should develop a coordinated plan to secure and/or acquire additional public access to the wetland and beach areas of Hilton Head Island.

CHAPTER SEVEN

Cultural Resources

I. Because of the potential threat to historic and archeological resources from continued development, it is extremely important that efforts are made to identify and preserve these surviving reminders of a rich and colorful past.

A. ISSUE: Hilton Head Island contains a significant number of both prehistoric and historic sites. Prehistoric archeological sites consist chiefly of Indian shell-rings and shell middens or mounds which date back to prehistoric times. Middens and shell rings offer a glimpse into the little-known life style and customs of prehistoric native Americans of the Southeast Atlantic coastal plain. In addition to this cultural information, these sites may yield biological information which could help to assess the changing conditions of the tidelands and evaluate present-day management and conservation practices.

Historic sites on Hilton Head Island are numerous and range from the former location of fresh water springs, where sailing vessels renewed their water supplies, to civil war earthwork fortifications, ruins of antebellum plantation houses and chapels as well as a slave cabin and numerous cemeteries. They represent an important part of our state's as well as our nation's heritage and deserve protection as a tangible link with and an irreplaceable record of past events and former ways of life.

As development continues on Hilton Head Island, historic and archeological sites may be threatened by construction of homes, commercial establishments, roads, highways, marinas and public facilities. The island's tangible heritage may be removed or damaged; historic and cultural information, as yet undiscovered, may never be brought to light; and the flavor of the island's history may be lost to future generations. Because of this potential threat, it is extremely important that efforts are made to preserve the surviving reminders of a rich and colorful past.

B. Existing Policies, Rules, Regulations, and "State of the Arts" Findings:

The S. C. Coastal Council is mandated by Section 2(B) of the State's Coastal Zone Management Act (Act 123 of 1977):

(2) To protect and, where possible, to restore or enhance the resources of the State's coastal zone for this and succeeding generations;

(5) To encourage and assist state agencies, counties, municipalities and regional agencies to exercise their responsibilities and powers in the coastal zone through the development and implementation of comprehensive programs to achieve wise use of coastal resources giving full consideration to ecological, cultural and historic values....

Thus, the Council, through its direct permitting authority for activities in the critical areas as well as its review and certification of other state agency permits, federal agency permits, project proposals subject to A-95 review and Environmental Impact Statements, must include, as part of its review, the protection of resources of cultural and historic significance.

As a part of this review the Council relies on the Office of the State Archeologist, S. C. Institute of Archeology and Anthropology and the S.C. Department of Archives and History for assessments of any impacts on cultural and historic resources. (Created in 1967, the S.C. Institute of Archeology and Anthropology is responsible for locating, recording, and excavating prehistoric and historic archeological sites and publishing interpretive reports on its findings. In addition to a number of other duties, the S. C. Department of Archives and History is responsible for developing and carrying out a plan for the preservation of the state's prehistoric, historic and cultural sites.)

Chapter IV of the State of South Carolina Coastal Management Program developed by the Coastal Council and approved by the State Legislature and the National Oceanic and Atmospheric Administration, U. S. Department of Commerce, contains a section entitled Geographic Areas of Particular Concern (GAPC's). One of the three categories within this section is entitled "Areas of Special Historic, Archeological or Cultural Significance" and is composed of sites which have been named to the National Register of Historic Places** as well as sites determined eligible to be named to the National Register. These sites classified as GAPC's receive the protection provided by the Coastal Council's direct and indirect permitting and review authorities.

The goals of the South Carolina Coastal Zone Management program for preservation and development of GAPC's of historic, archeological or cultural significance are:

> "To give highest priority to the identified primary value of a GAPC when considering the preservation or development of that area.
>
> To ensure that management of GAPC's is consistent with other policies of the South Carolina coastal zone management program" (CMP, p. IV-3)

In its review of proposed activities which will impact areas of special historic, archeological or cultural significance listed in the management program, the Council uses the following priority-use criteria for these areas, beginning with the use of highest priority:

> " 1) Uses which preserve the historical or cultural values for which the site was placed on the National Register;
>
> 2) Educational opportunities for the public regarding the historical, archeological or cultural significance of the site as long as the site is not disturbed." (CMP, p. IV-25)

Upon Council adoption of a Special Area Management Plan for Hilton Head Island, sites listed in the plan will be given the same protection accorded GAPC sites.

**The National Register of Historic Places was created in 1966 with the passage in that year of the National Historic Preservation Act (P.L. 89-665). This act authorized the Secretary of the Interior "to expand and maintain a national register of districts, sites, buildings, structures and objects significant in American history, architecture, archeology, and culture...." The significance of properties nominated to the National Register is evaluated in accordance with an established set of criteria. Benefits of listing in the National Register are:

1) makes private property owners eligible to be considered for federal grants-in-aid for historic preservation through state programs;

2) provides protection by requiring comment from the Advisory Council on Historic Preservation on the effect of federally assisted projects on these resources;

3) makes owners who rehabilitate certified historic properties eligible for federal tax benefits.

C. Policies

1. Sites, including those listed in the Hilton Head Island Special Area Management Plan (SAMP), should either be left untouched (except for investigation carried out or authorized by the S. C. Department of Archives and History and/or the South Carolina Institute of Archeology and Anthropology) or preserved and/or restored as a tangible record of past events and former ways of life.

2. Should it be determined that any site, including those listed in the Hilton Head Island SAMP, may be adversely impacted by proposed development, the S. C. Coastal Council will contact the S. C. Department of Archives and History and the S. C. Institute of Archeology and Anthropology for comments and recommendations.

3. Protection of structures and sites shall include one or more of the following requirements by the S. C. Coastal Council:

   A. An appropriate set back line from the site or structure shall be maintained behind which development may take place.

   B. Appropriate vegetative buffers may be required to shield the site or structure from adverse impacts of uses incompatible to its special historic, archeological or cultural significance.

   C. A reasonable opportunity for professional investigation of the site or structure may be required at the request of the S. C. Department of Archives and History and/or the S. C. Institute of Archeology and Anthropology.

(The following policies, while not enforceable, are recommended.)

1. Developers are strongly urged to communicate early-on with the South Carolina Coastal Council to discuss plans for development in order to work out potential problems and avoid unnecessary delays and expense with regard to the review of their projects.

2. Developers are encouraged to seek the assistance and advice of the Hilton Head Island Historical Society, the S. C. Department of Archives and History and the S. C. Institute of Archeology and Anthropology in efforts to preserve historic and archeological sites found on their properties.

3. Because the above list of historic and archeological sites represents the best information available at present and is not a totally complete and up-to-date listing, it is recommended that a comprehensive cultural resources survey of the area be conducted by the appropriate agency or agencies as soon as funding is available.

APPENDIX A

MATRIX OF BEST MANAGEMENT

PRACTICES FOR STORMWATER

RUNOFF CONTROLS

CONTROLS	CONTROL MEASURES	RUNOFF PROBLEM AREAS Lawns	Parking Areas	Streets and Highways	Driveways	Sidewalks	Decks and Patios	Roofs	Slopes	Construction Sites	Cleared Sites	Golf Courses and Large Flat Surfaces	Surface Drainageways	Surface Water, Lagoons and Streams
INFILTRATION	Dry Wells						●	●						
	Infiltration Trenches	●	●	●	●	●	●	●						
	Sand Pits						●	●						
	Grassed Swales	●		●	●	●	●					●	●	
	Perforated Underground Piping	●	●	●	●		●	●				●		
	Sheet Flow Over Grass	●	●	●	●	●	●	●				●	●	
	Use of Marshes and Wetlands		●	●									●	●
	Careful Landscape Design	●	●	●	●	●	●	●	●			●	●	●
ROOFTOP RUNOFF	Rooftop Detention							●						
	Rooftop Storage							●						
	Rooftop Detention Rings							●						
	Gutterless Eaves						●	●						
	Splash Blocks/Trenches							●						
STORAGE	Retention Ponds		●	●								●	●	●
	Detention Storage		●	●						●		●	●	●
	Storage Cisterns		●				●	●						
	Dry Ponds			●	●									
STREETS, DRIVEWAYS & PARKING AREAS	Crowned Profile for Sheet Flow		●	●	●		●							
	No, Interrupted or Pierced Curbs		●	●	●		●							
	Porous Asphalt Paving		●	●	●		●							
	Gravel, Sand, Shell, Hull or Pine Needle Surfaces		●		●	●								
	Lattice Block Pavers		●		●	●	●							
	Brick or Block Pavers on Sand Bed		●		●	●	●							
	Paved Tire Strips		●		●									
	Regular Sweeping		●	●	●	●	●							
	Vacuum/Sweeping		●	●	●	●	●							
	Filter Strips		●		●	●	●							
	Seepage Pits	●					●							
	Depressed Grass Medians		●	●										
	Grassed Waterways	●		●							●	●		

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	Parking Lot Storage		●											
	Trash Collection	●	●	●	●	●	●			●		●		
	Grease/Sediment Traps		●							●			●	
	Controlled Rate Inlets		●	●										
PESTICIDES/ HERBICIDES/ FERTILIZERS	Correct Application	●										●		
	Correct Mixtures	●										●		
	Careful Use Near Water	●										●		
	Careful Container Disposal	●												
VEGETATION	Minimization of Stripped Areas	●		●	●	●	●		●	●		●	●	
	Grubbing Omitted								●					
	Conservation of Topsoil	●							●	●		●		
	Temporary Mulching or Seeding	●		●					●	●		●	●	
	Seeding	●		●					●	●		●	●	
	Mulches	●		●					●	●		●	●	
	Matting			●					●	●			●	
	Hydroseeding			●					●	●		●	●	
	Sodding	●							●			●	●	
	Use of Absorptive Marine Plants													●
	Retention of Natural Vegetation	●		●					●	●			●	●
	Vegetated Buffers Around Surface Waters	●	●	●	●	●	●		●	●	●	●	●	●
DIVERSION AND SLOPE CONTROLS	Selective Grading and Shaping	●	●	●	●	●	●		●	●		●	●	●
	Diversion Berm	●	●	●	●		●		●	●		●	●	
	Interceptor Berm	●	●	●	●		●			●			●	
	Diversion Ditch			●	●				●	●			●	
	Terraces								●					
	Retaining Walls	●							●					●
	Sandbag or Straw Bale Barriers			●					●	●				
SURFACE DRAINAGEWAYS	Grassed Waterways		●	●						●		●	●	
	Natural Channel Pattern											●	●	●
	Grade Control Structures									●				
	Sediment Trap		●	●					●	●		●	●	●
	Sediment Basin		●	●					●	●		●	●	●

OTHER MEASURES	Filter Inlet	●							●					
	Aggregate Cover	●		●	●									
	Filter Berm	●	●					●			●			
	Traffic Control on Construction Sites	●	●						●		●			

SOURCES:

Preventive Approaches to Stormwater Management. EPA, PB-268-546.

Planning Methodologies for Analysis of Land Use/Water Quality Relationships Case Study Application, EPA, PB-273-411.

Michigan Soil Erosion and Sedimentation Control Guidebook, Michigan Department of Natural Resources.

Stormwater Runoff Control-Urban, Virginia State Water Control Board.

Prepared By: Moore, Gardner & Associates - Engineers

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APPENDIX B. CUBIT ENGINEERING LTD.
CALIBOGUE SOUND DYE STUDY

EVALUATION OF PROPOSED SEWAGE OUTFALL
ON WATER QUALITY OF CALIBOGUE SOUND

JUNE 1982

submitted to

SEA PINES PUBLIC SERVICE DISTRICT

CUBIT ENGINEERING LIMITED
CLEMSON, SOUTH CAROLINA

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5.0 Conclusions 16

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1.0. EXECUTIVE SUMMARY

A water quality assessment of the proposed Sea Pines sewage outfall in Calibogue Sound was conducted to estimate its impact on the area's receiving waters. The scope of services consisted of a field measurement survey to collect data for the subsequent numerical model analysis that was performed.

The field study defined hydraulic parameters of the system. In addition, Rhodamine-WT dye was injected and monitored for a flood tide cycle to provide information on mixing and upstream excursion of a pollutant. Dye did not advance beyond Middle Marsh Island in Calibogue Sound during the period of the study; furthermore no appreciable amounts were found in Broad Creek or the Cooper River past the mouth of Bull Creek.

Some dye entered Bull Creek but advanced no further than about 6,000 feet upstream from the Cooper River. The estuary is well mixed as evidenced from measured temperature/conductivity depth profiles. As a result injected dye rapidly dispersed to concentrations ranging from an initial value of about 10 ppb to final readings of 0.4 ppb at the end of flood tide flow.

A version of the Dynamic Estuary Model was selected to numerically simulate the estuarine conditions; the model reproduced tidal flow in the system and calculated several water quality parameters in response to the advection, dispersion, and mixing phenomena of the estuary. The calibrated model was used to simulate the effects on Calibogue Sound of adding a three mgd discharge of secondary-treatment wastewater. The model showed that the discharge located near Braddock Cove would have no effect on the water quality of the Sound or its tributaries.

2.0 INTRODUCTION

This report presents the results of an assessment of effluent discharge in Calibogue Sound resulting from the proposed Sea Pines sewage outfall. Approximately three million gallons per day of secondary treated domestic sewage is being considered for disposal in Calibogue Sound from the Sea Pines Plantation. Figure 1 shows the general vicinity of the area and the location of the proposed outfall. In order to assess the environmental impact of waste disposal in Calibogue Sound and adjacent areas, the Sea Pines Public Service District contracted with Cubit Engineering Limited to investigate the outfall concept in terms of its effect on water quality of the receiving waters.

The study was conducted primarily via a numerical model analysis of the Calibogue Sound system to simulate the tidal hydraulics of the area and the behavior of the effluent within the Sound and its tributaries if continuously discharged into the system. A field study was also performed to obtain data for calibrating the model. Tide stage, current velocity and other physical data were collected to describe the hydrodynamics of the Sound. In addition, tracer dye was injected at the outfall site and monitored through a flood-tide cycle to provide information on dispersion and excursion characteristics within the system; this was also done for model verification purposes.

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his report describes the field study and numerical model
is in greater detail in the following two sections. An
retation of the results is given in the last section in
of the impact of the outfall on local water quality.

ELD PROGRAM

ethodology

ata was collected in Calibogue Sound for purposes of
ating a numerical model. This section of the report
bes the field work performed and summarizes the recorded
In general, the work consisted of injecting a large dose of
scent dye at the proposed outfall location and monitoring
ate of movement, spread, and extent of excursion in
gue Sound and tributary channels on a flood tide. The
was conducted during March 16-18, 1982, at a time of Spring

he dye was monitored using three small boats. Two were
ed with Turner Designs Model 10 fluorometers to measure the
tration of dye near the surface. Water was pumped
uously through the instrument via a small bilge pump and
ssembly. One boat was dedicated to tracing the movement of
incipal dye cloud while the other was dispatched to various
and tributaries of the estuary to monitor dye movement into
channels and provide backup inormation for the main boat.
hird boat performed the dye injection at low-water, slack
d collected numerous surface water samples in Broad Creek
ther areas and provided logistical support to the other
ts. In addition, the third boat was responsible for

measuring current velocity in the main channel near the outfall site.

Horizontal positioning was achieved on the main boat using a Motorola Mini-Ranger III electronic distance measurer. A series of four transponder stations were erected onshore at known chart positions (Figure 2). By measuring electronically the distance between any two stations, the position of a boat could be triangulated to an accuracy of + or - 3 meters. The second and third boats used navigation markers and landmarks to visually estimate location.

Fifty pounds of Rhodamine-WT dye was injected with the assistance of a small pump mounted in the boat. Dye was pumped in a continuous stream at a rate of 0.25 liters per minute while the boat traversed the throat of the Sound. Approximately 45 minutes was required to deploy the entire quantity of dye in a back and forth pattern at the surface of Calibogue Sound near the proposed outfall site. Dye was injected during low water slack under calm wind conditions. In this manner, the dye remained relatively concentrated prior to the initial stages of flood tide.

Drogues were deployed in the dye cloud as a means to monitor its relative movement up the Sound. Their use was principally qualitative in nature serving as visual tracers to queue times and locations of flourmeter measurement and maximum excursion of the flood tide water mass.

Tidal stillwater elevations were measured at two locations visually using tide staffs. Continuous measurements were made at Braddock Cove and the Highway 278 bridge. Figure 2 shows the dye

SUBJECT FIGURE 2 SHEET ___ OF

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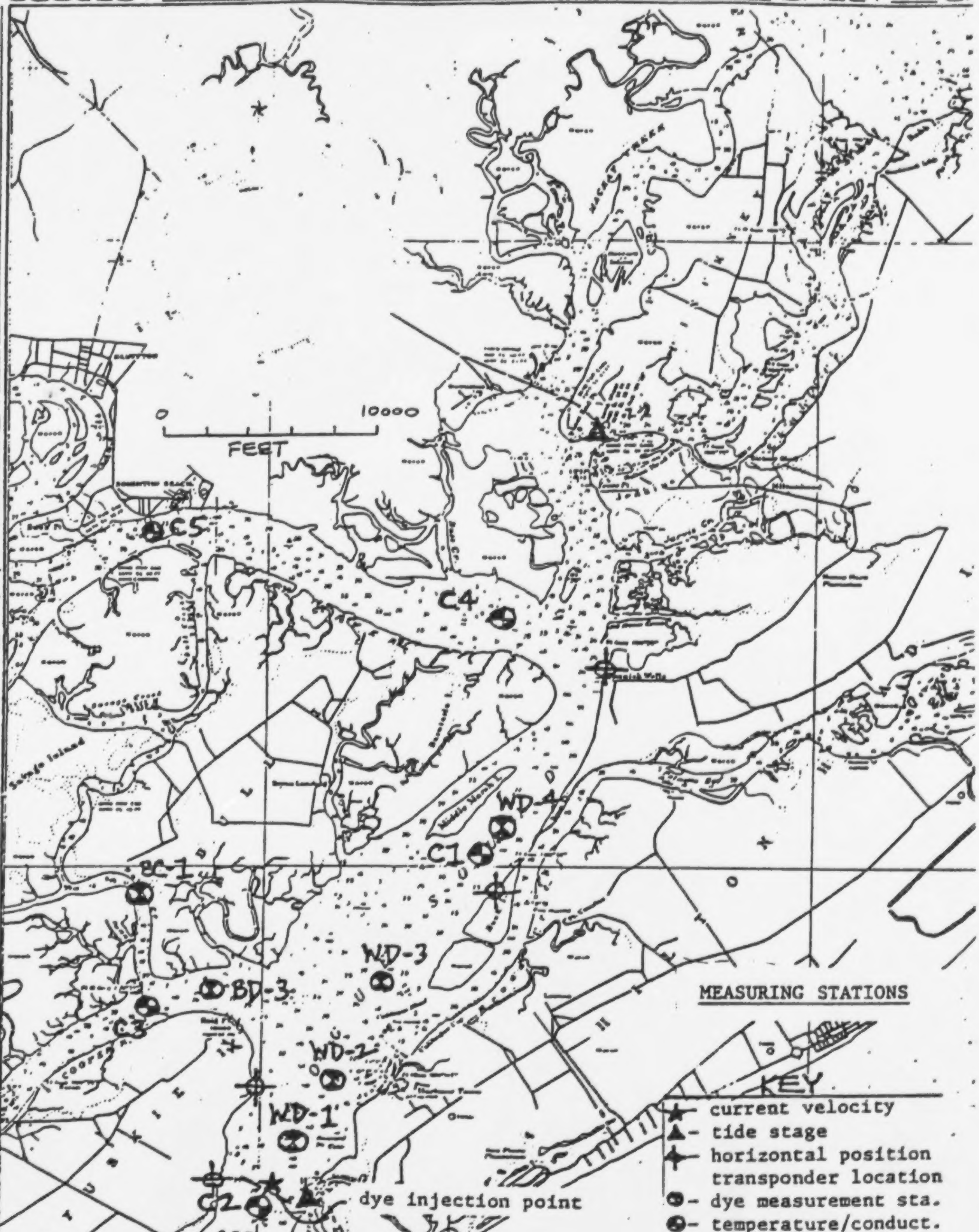
0
10000
FEET
C5
C4
WD-4
C1
BC-1
WD-3
BD-3
C3
WD-2
WD-1
C2
dye injection point
MEASURING STATIONS
KEY
★ - current velocity
▲ - tide stage
⊕ - horizontal position transponder location
◐ - dye measurement sta.
◐ - temperature/conduct. profile location

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injection point and the tide measurement locations.

Measurements of dye concentration and tidal elevation were made throughout the flood tide cycle until high water slack. Data were recorded to map dye movement and dilution of the principal dye mass in Calibogue Sound and in the tributary channels. Tidal current was measured at approximate half-hour intervals using a Marsh McBirney electromagnetic current meter sidecasted from an anchored position.

On the following day, a Martek instrument was used to determine the profile of temperature, depth and salinity in the water column of Calibogue Sound. The purpose of this task was to determine if the estuary was well mixed or exhibited any characteristics of stratification. The individual water samples collected during the day were read for dye concentration in the evening using the fluorometer.

Table I gives a summary of the various measurements made during the field survey. The locations indicated are given in Figure 2.

TABLE I. Type and Location of Field Measurements

Measurement	Location
Velocity	A1
Salinity	C1, C2, C3, C4, C5
Temperature	C1, C2, C3, C4, C5
Dye	various
Drogues	various
Location	All stations for main boat

3.2 Results

Results of the field study are summarizesd in Figures 3 through 7. Stage and current velocity data are reduced in Figures 3 and 4. Measured dye concentration and characteristics of the dye cloud shape and movement are given in Figures 6 and 7. An indication of the degree of mixing experienced in Calibogue Sound can be seen in Figure 5 by the almost vertical lines of temperature and conductivity with depth; this is indicative of a well mixed estuary as would be expected since there is no substantial freshwater flow to the Sound.

Dispersion and dilution of the injected dye may be inferred from Figures 6 and 7. Figure 6 shows the profile of the dye cloud at successive time intervals as it progressed upstream in Calibogue Sound toward Port Royal Sound. Each profile represents the concentration of dye measured by the main boat while it was anchored on station. In this manner a relative measure of dye dispersion was obtained by measuring dye concentration versus time as the cloud flowed past several stations. The decrease in peak concentration and the lateral spreading of the dye may be inferred by comparing the successive measurements. Figure 7 summarizes peak dye concentrations measured at each of the four monitoring stations. The concentrations are presented with reference to the initial concentration of Rhodamine dye injected. This figure illustrates the relative dispersion and mixing which cumulatively reduces the concentration of dye as it mixes laterally and vertically with the ambient waters of Calibogue Sound and the tidal prism.

Virtually no dye was observed in Broad Creek; this

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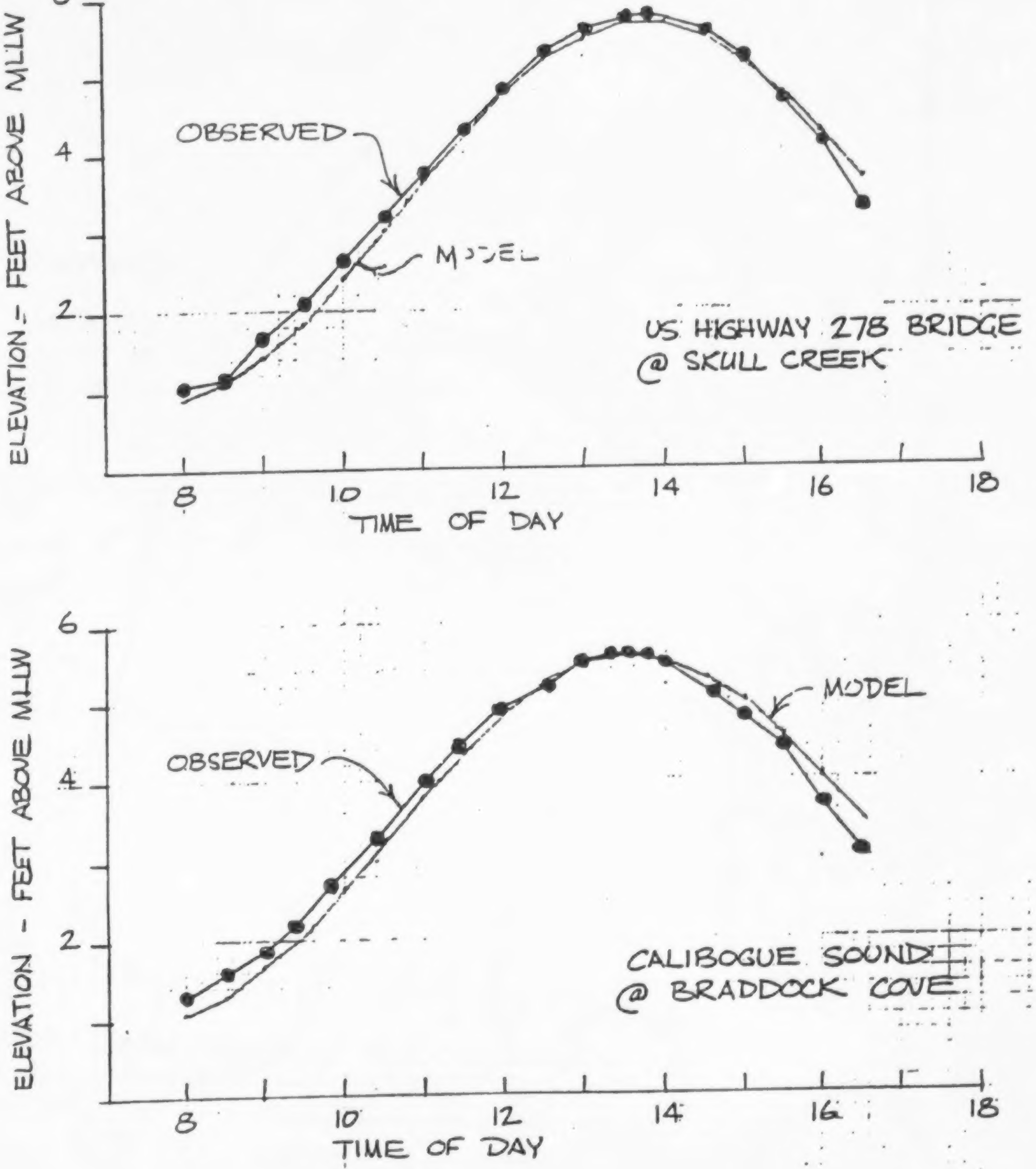

OBSERVED TIDE - MARCH 17, 1982

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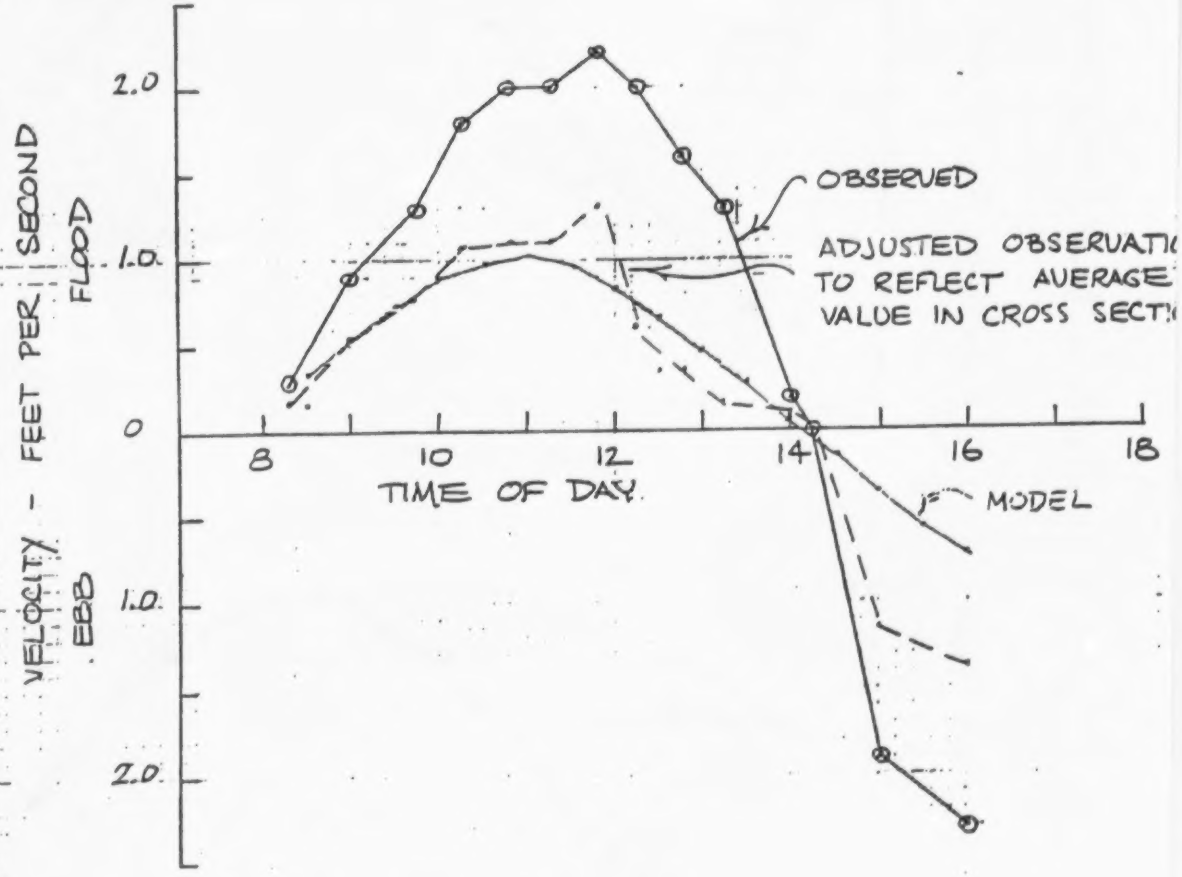

OBSERVED CURRENT VELOCITY

@ CALIBOGUE SOUND NEAR BRADDOCK CO
CENTERLINE OF CHANNEL 5 FEET
BELOW SURFACE

MARCH 17, 1982

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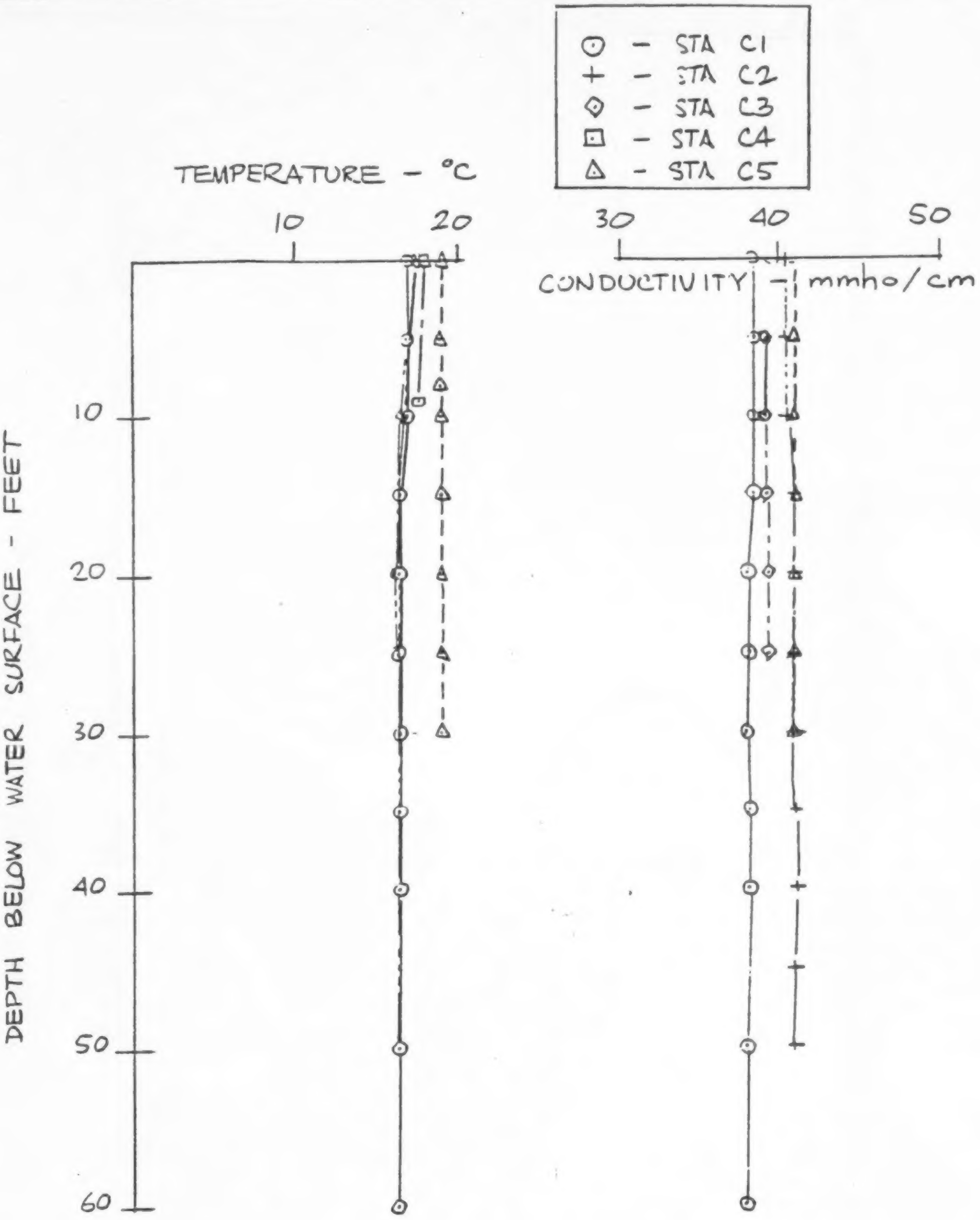

TEMPERATURE - CONDUCTIVITY vs DEPTH
CALIBOGUE SOUND MARCH 19, 1982

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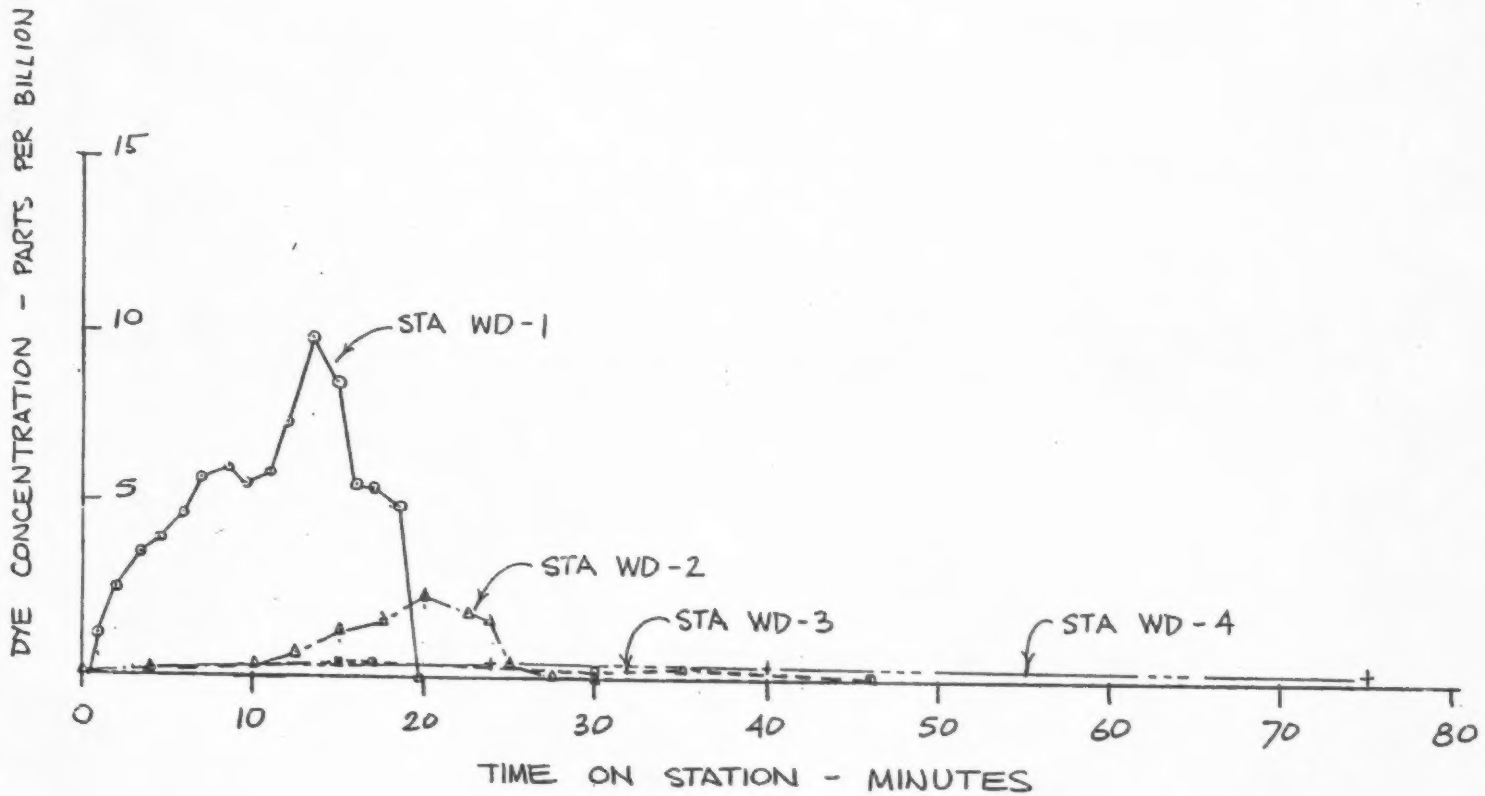

DYE CONCENTRATION PROFILES

MEASURED IN CALIBOGUE SOUND MARCH 18, 1982

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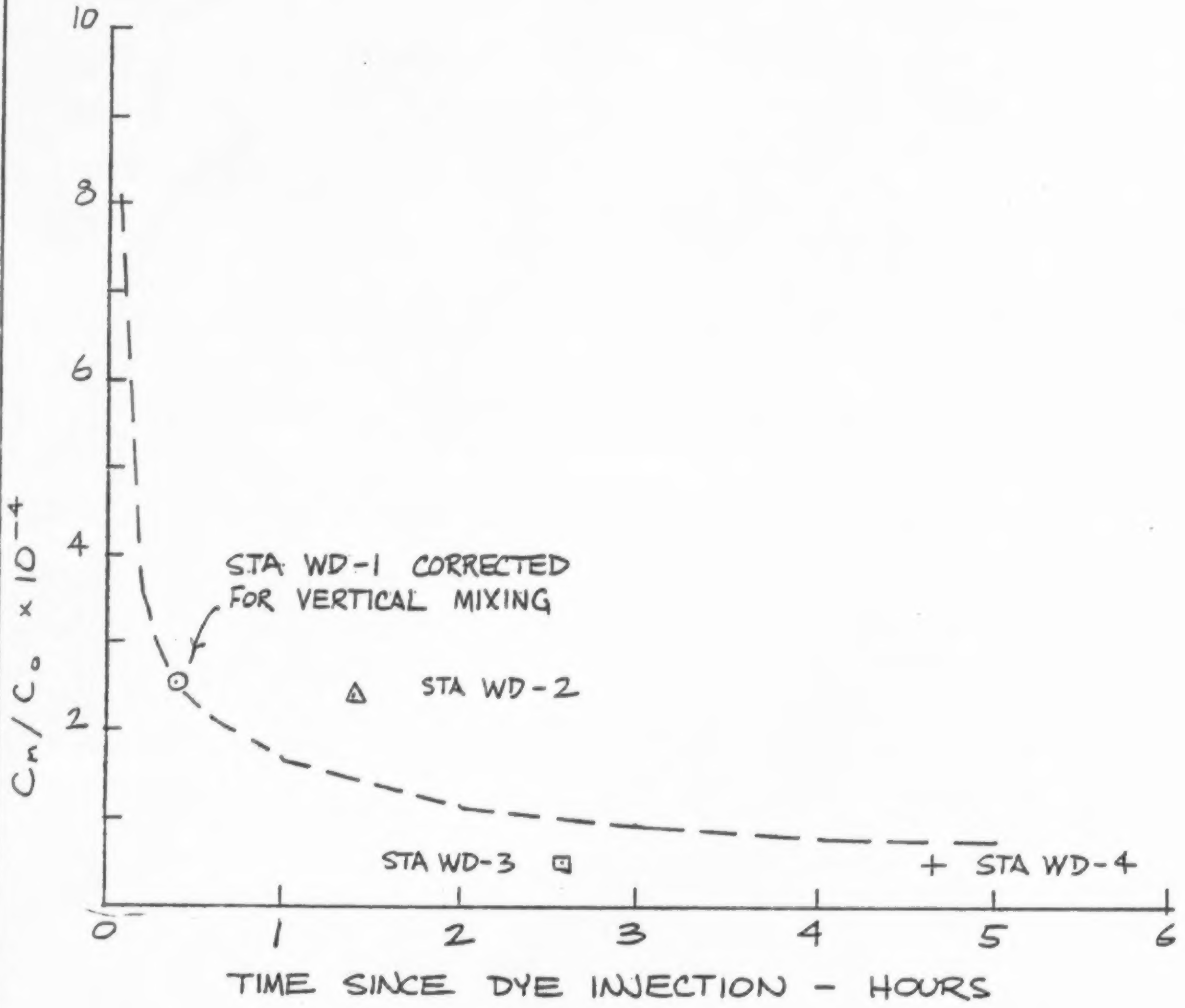


PEAK DYE CONCENTRATION vs. TIME

MEASURED IN CALIBOGUE SOUND MARCH 18, 1982 phenomenon probably occurred because of hydrodynamic momentum of water flow northward in Calibogue Sound which hinders transport across the relatively shallow entrance to the creek.

Dye entered the Cooper River at Haig Point but did not continue past the mouth of Bull Creek at any appreciable concentration. Instead, the main slug of tracer entered Bull Creek but progressed no further than the first major bend in the creek during this study.

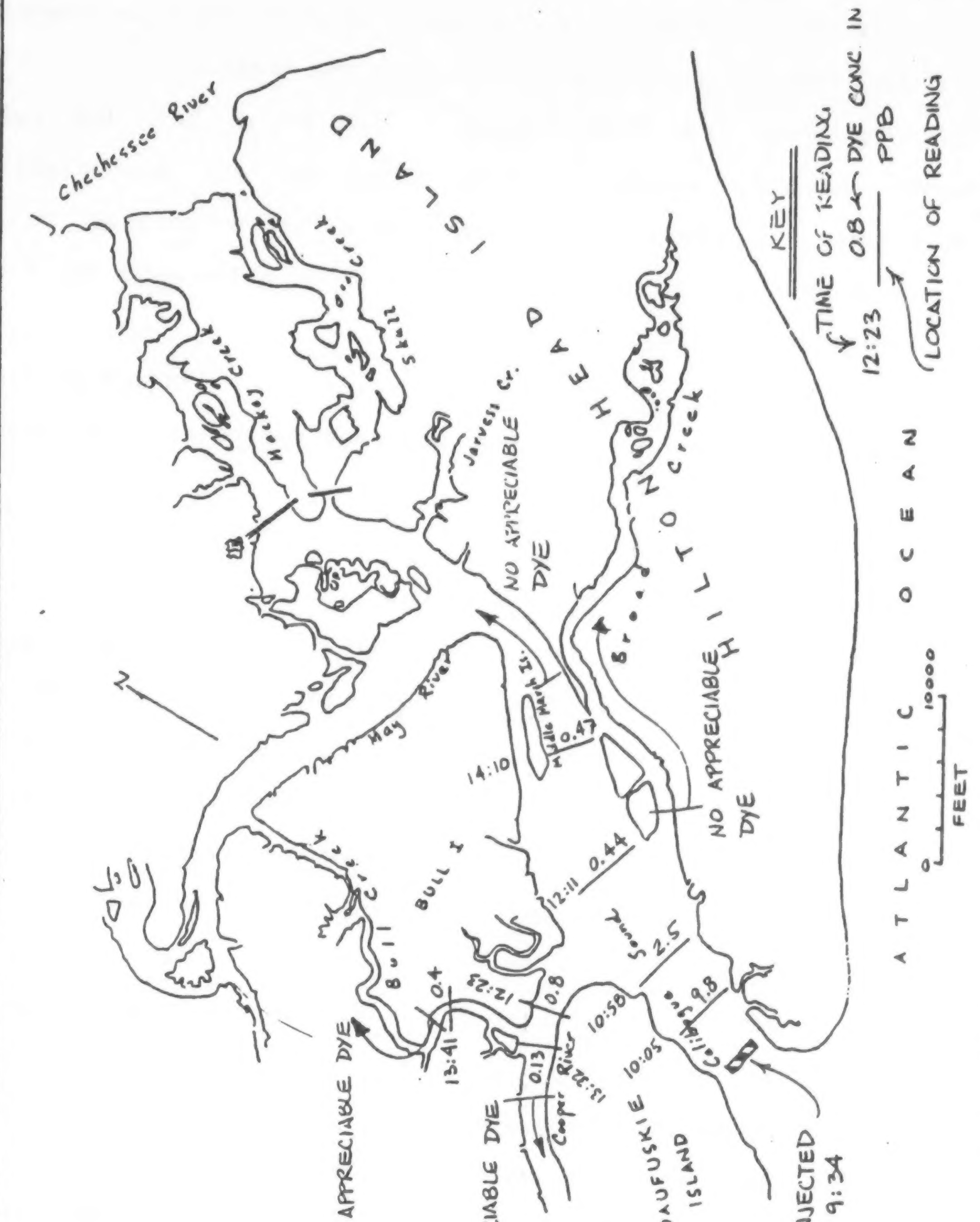
Figure 8 summarizes the maximum excursion of the dye within the study site as well as intermediate peak concentrations that were measured.

4.0 NUMERICAL ANALYSIS

The second major component of the study consisted of the development and calibration of a numerical model of the Calibogue Sound area. The primary purpose of the model was to provide a capability for predicting the effects of a potential effluent discharge from the southern end of Hilton Head into Calibogue Sound and its tributaries. The numerical analysis of water quality in the system is based upon two primary processes: a transportation process and a reaction process. The transport process is hydrodynamic and includes advection, diffusion and dispersion as well as the forcing function of the tides and water inflows from tributaries and waste sources. The reaction process includes the sources and sinks of a constituent which affects water quality in Calibogue Sound and that reaction which the constituent may experience including physical, chemical, and biological processes. The reaction process can consist of

SUBJECT FIGURE 3 SHEET C

JOB SEA PINES PUBLIC SERVICE DISTRICT DATE 6/2/82 BY JT Modice


Chechessee River
ISLAND
HEAD
HILTON
Skull Creek
Mackay Creek
Jarvesi Cr.
NO APPRECIABLE DYE
Broad Creek
May River
Middle Marsh I.
0.47
14:10
NO APPRECIABLE DYE
12:11
0.44
Bull I
Bull Creek
Sound
2.5
9.8
Calibogue
10:05
10:58
0.8
12:23
0.4
13:41
NO APPRECIABLE DYE
0.13
13:22
Cooper River
NO APPRECIABLE DYE
DAUFUSKIE ISLAND
DYE INJECTED 8:49 - 9:34
ATLANTIC OCEAN
0
10000
FEET
N
KEY
TIME OF READING
12:23
0.8
DYE CONC IN PPB
LOCATION OF READING

EXCURSION OF PEAK DYE CONCENTRATION

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sedimentation and flocculation of organics, uptake of oxygen by bacteria, the oxidation of waste and the decay rate of coliform bacteria.

4.1 Numerical Model

Several numerical models are currently available which could be adapted to this problem. However, it was felt at the outset that because the Calibogue Sound system is not extremely wide, a one-dimensional model could be employed. The model chosen for this study is essentially the Dynamic Estuary Model which was presented by Orlob, et al. (1967), Feigner and Harris (1970), and Callaway, Byram and Ditsworth (1971. This model does have some minor modifications from the EPA version. This model is quite similar to the receiving water part of the Storm Water Management Model with the exception of the addition of dispersion. The Dynamic Estuary Model has been used extensively in estuarine situations to successfully model the hydrodynamics and water quality.

The one-dimensional representation of flow in an estuary is given in the Dynamic Estuary Model as:

$$\frac{\partial h}{\partial t} = - \frac{1}{B} \frac{\partial uA}{\partial x} \qquad (1)$$

$$\frac{\partial u}{\partial t} + u \frac{\partial u}{\partial x} = - g \frac{\partial h}{\partial x} - ku|u| + \zeta \frac{w^2}{d} \cos \theta \qquad (2)$$

where:
A = channel area
B = channel width
d = channel depth
h = tidal stage
u = water velocity
ζ = friction coefficient from wind over the water surface
θ = angle between wind and channel alignment
w = wind velocity

e hydraulic friction coefficient is:

$$k = \frac{n^2}{(1.49)^2 R^{4/3}} \text{..................................(3)}$$

ere: n = Manning's roughness coefficient
R = hydraulic radius

No Coriolis effect is included in this representation due to e dimensions of Calibogue Sound. After suitable changes are de in the above equations, they can be written in finite fference form. The solution of this set of equations proceeds dependently of the constitutive transport since the density of ie water is assumed constant throughout the system. scretization of the equations of motion for the finite fference scheme results in a system of channels and junctions. ı explicit integration scheme, employing a two-step Runge-Kutta -ocedure, is used to solve the equations.

The model simulates the tidal flow throughout the estuary as aused by fixed tributary inflows and a repetitious tidal forcing :tion. The calculations produce at even intervals of Δ t a time istory of head, flow and velocity throughout the system. hese parameters are then used as input to the constitutive quations.

The quality parameters that are considered in this study are iochemical oxygen demand (BOD), dissolved oxygen (DO), fecal oliform, and temperature. These are modeled according to the eneral transport equation:

$$\frac{\partial c}{\partial t} + u\frac{\partial c}{\partial x} = E\frac{\partial^2 c}{\partial x^2} \pm \Sigma s \text{ ....(4)}$$

where: c = concentration of constituent
E = a dispersion coefficient
Σs = summation of sources and sinks of the constituent

A source or sink could consist of a reaction with another constituent. Consider first the relationship for biochemical oxygen demand (BOD). The equation describing the distribution of BOD throughout the system is:

$$\frac{\partial L}{\partial t} + u\frac{\partial L}{\partial x} = E\frac{\partial^2 L}{\partial x^2} - K_1 L \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

where L is BOD and K_1 is the deoxygenation rate coefficient. Likewise the equation for dissolved oxygen, DO is given by:

$$\frac{\partial C}{\partial t} + u\frac{\partial C}{\partial x} = E\frac{\partial^2 C}{\partial x^2} - K_1 L + K_2(C_s - C) - S_b \ldots\ldots\ldots (6)$$

in which C is dissolved oxygen, K_2 is the reaeration rate, C_s is the saturation level of dissolved oxygen, and S_b is the benthic oxygen demand. There are numerous other sources and sinks that could be included in the equations. Although their inclusion would more closely approximate nature, these terms would only add unnecessary complexity to this presentation without enhancing the accuracy of the results.

The equation describing the transport of fecal coliform in the system is given by:

$$\frac{\partial P}{\partial t} + u\frac{\partial P}{\partial x} = E\frac{\partial^2 P}{\partial x^2} = K_3 P \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

in which is the coliform concentration and K is the die-away rate of the organisms. Equations (5), (6), and (7) describe the transportation of L, C, and P in the estuarine system and the interrelationships that exist among these three parameters. These equations are not completely general but are adequate to describe the system within reasonable limits. The assumptions upon which this formulation is based are that:

1. the properties of water do not vary;
2. the longitudinal dispersion coefficient is constant
3. the entire system is pseudo-one-dimensional;
4. E is the same for all constituents; and
5. there are no gradients in the vertical or transverse horizontal direction.

The dependency of Equations (5) and (6) on temperature is through K_1, K_2, and C_s. All three of these terms are temperature-dependent. The saturation concentration of DO varies as:

$$C_s = 14.652 - 0.41022T^2 + 0.007991T^2 - 0.000077774T^3 \quad ..(8)$$

for temperature T, given in °C. The deoxygenation rate coefficient, K_1, is functionally related to temperature as:

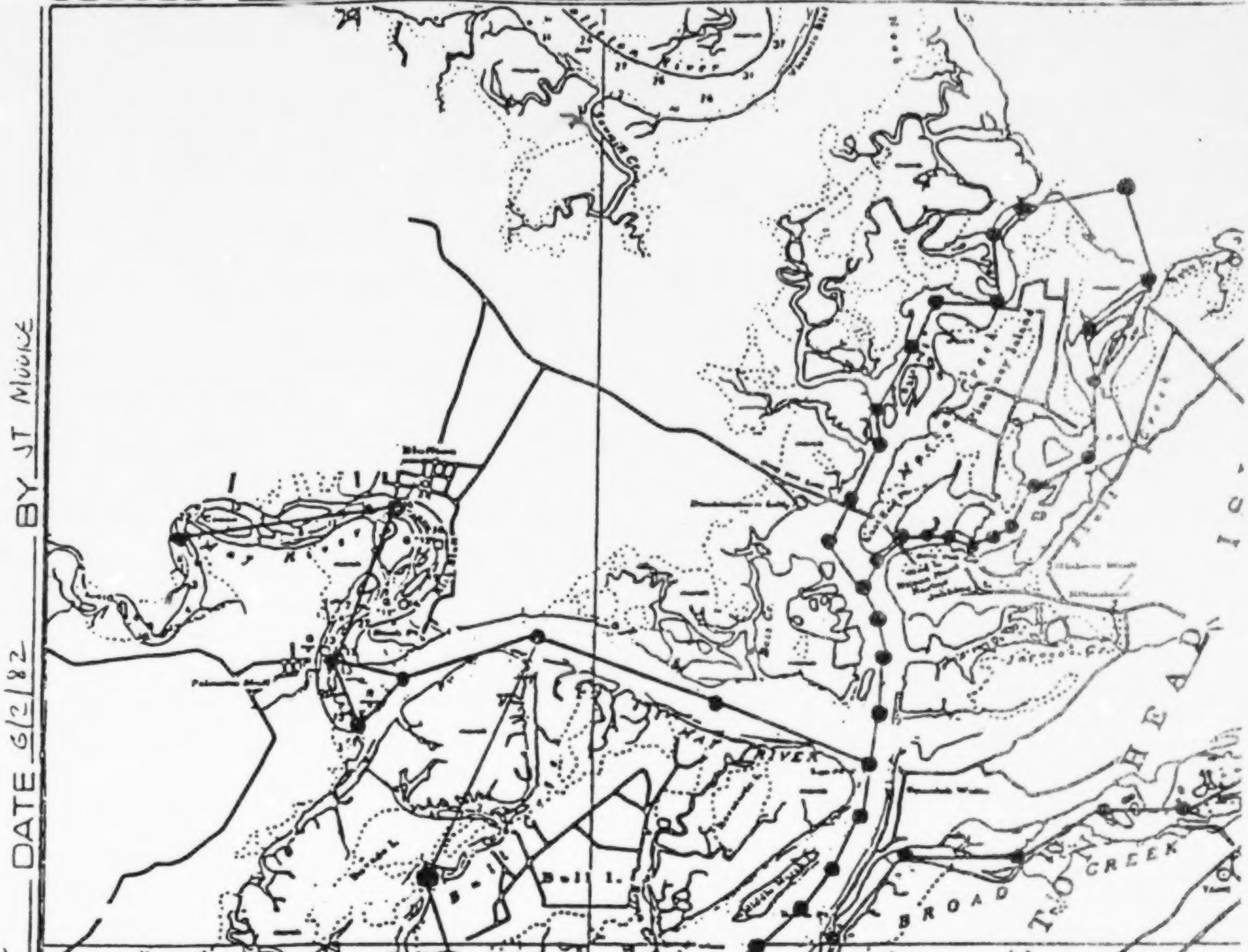
$$K_1(T) = K_1(20°C)\,[1.047]^{(T-20)} \quad ....(9)$$

The reaeration rate coefficient, K_2, is a function of temperature as well as channel and flow conditions. The temperature dependency is given by:

$$K_2(T) = K_2(20°C)\,[1.024]^{(T-20)} \quad ....(10)$$

SUBJECT FIGURE 9 SHEET ___ OF ___

JOB SEA PINES PUBLIC SERVICE DISTRICT DATE 6/2/82 BY JT Moore


MAY RIVER
Bull I.
Cooper River
Daufuskie Island
Calibogue Sound
BROAD CREEK
HILTON HEAD IS.
Forest Beach
Harbour Town
● JUNCTION
— CHANNEL

MODEL SCHEMATIZATION
CALIBOGUE SOUND & VICINITY

CUBIT ENGINEERING LIMITED

Values of the equilibrium temperature are merely assumed as input information for this particular estuarine system, since adequate values of solar radiation, atmospheric radiation, long-wave back radiation, evaporative heat flux, and convective heat flux are unavailable.

An explicit integration technique is used in the model to solve the constitutive Equations (5), (6), and (7). To minimize the numerical errors associated with the convective transport computation, the quarter-point difference solution technique is used. This technique effectively minimizes the pseudo-dispersion transport and results in reasonably accurate and stable solutions for adequate time steps in accord with the Curant conditions.

A schematic description of the Calibogue Sound estuarine system is shown in Figure 9. To adequately represent the Calibogue Sound estuarine system a total of 63 channels and 60 junctions were used. The specific characteristics of the tidal junction and channel data are given in Appendix A. That cdata includes channel friction, velocities, and tidal elevations for the initial conditions of the model. The data also include the geometry of the configuration of the model, that is, the channel-junction relationships.

4.2 Model Parameters

Operation of the model of Calibogue Sound requires the identification of several variables and adjustable parameters that reflect the mechanics, microbiology and chemistry of the system. The hydrodynamics of the model are based on the tidal variation at the ocean and at Port Royal Sound, the channel geometry as presented in Appendix A, flow from rivers and outfalls, channel roughness coefficients and exchange coefficient. A single value for the roughness coefficient (Manning's n) of 0.025 was chosen to be representative throughout the system. Obviously the value will vary throughout the real system but based on the amount of available hydraulic data, it was felt that a constant value throughout the system would be most prudent. There was no significant external flow or tributaries coming into the system therefore no additional inflow was input to the model except for that coming from the proposed outfall at Sea Pines.

In the water quality model it is necessary to input the BOD deoxygenation rate, DO reaeration coefficient, exchange coefficient, equilibrium temperature, dispersion coefficient, and decay coefficient for coliform. Additionally, it was necessary to begin the model at some point, therefore initial conditions had to be assumed. The model also requires boundary values for the quality constituents--temperature, DO, BOD and fecal coliform--at junction 1, the ocean, and junction 2, Port Royal Sound. Values for the initial conditions are given in Table A. Likewise values for the rate kinetics are given in Table II. Although the model has capabilities to incorporate benthic oxygen uptake, it was decided not to include that factor at this time.

4.3 Model Calibration

The hydrodynamic model was calibrated using the hydraulic information that was measured in the field study of 16-18, 1982.

The model was compared with the field measured velocities and water levels. A comparison of the measured tidal heights at the Highway 278 bridge and at Braddock Cove are given in Figure 3. The measured tidal data are discussed in detail in the previous chapter of this report. A comparison of the velocities obtained at Braddock Point from the model with the field survey are shown in Figure 4. It is pointed out that the field results represent the highest velocities of the section across Calibogue Sound and when adjusted to give a representative cross-sectional average agree well with the model results. It is felt that these results indicate very good agreement between the hydrodynamics, the model and the actual measuerements of the system. Thus it is felt that the predictions that can be made with the hydrodynamics of the system are adequate for the evaluation of the effect of the proposed waste water discharge. An interesting result of the hydrodynamics is that there is a net flow of approximately 10,000 cfs through Calibogue Sound into Port Royal Sound. Thus any continuously released substance will be transported into Port Royal Sound.

TABLE II. Rate Kinetics Used in Model

Parameter	Value 1/day
Reoxygenation	0.25
BOD Decay	0.23
Coliform Die-away	0.5

To calibrate the water quality aspects of the model it was necessary to simulate the instantaneous dye injection which is discussed previously in this report. Comparisons of the field and simulated data show good agreement (e.g. Figure 10). Unfortunately there are no data available to calibrate the dissolved biochemical oxygen demand or coliform. In essence the model is calibrated for the transport of the material with the addition of some "acceptable rare kinetics.

4.4 Results of Outfall Analysis

To investigate the effects of the proposed wastewater discharge attention was focussed on BOD, DO and fecal coliform. It was assumed that the outfall discharged continuously at three mgd (eight cfs) with the following concentrations

dissolved oxygen = 5 mg/l
BOD = 30 mg/l
coliform = 70 MPN/100 ml

Additionally summer conditions were assumed to prevail with ocean waters at 26 °C rising to 28 °C inside the Sound and its tributaries.

Simulations of water quality were made without the proposed discharge for background or base conditions. Next, a simulation was made including the wastewater discharge with the characteristics presented above. The results of the two simulations are nearly identical. There is less than one per cent change in biochemical oxygen demand and no preceptable change in dissolved osygen. The results are summarized in Table III. The dissolved oxygen ranged from 6.0 ppm at the ocean boundary to as low as 5.03 ppm in the interior locations

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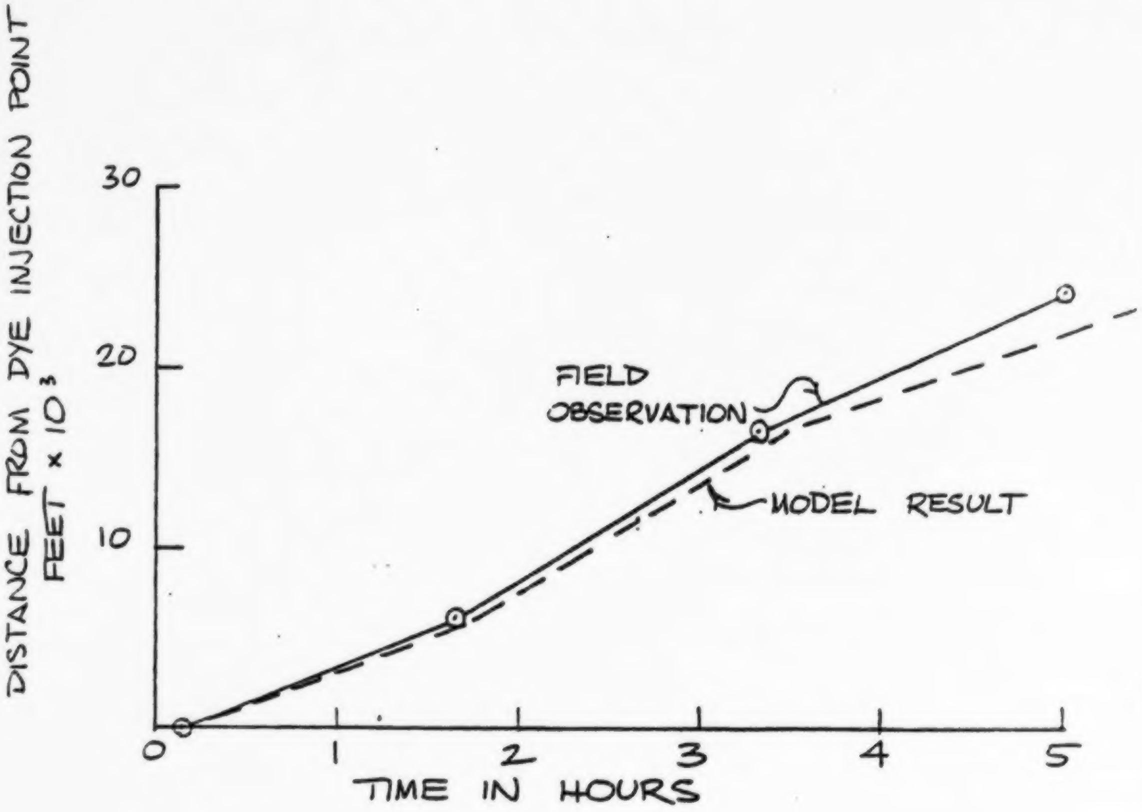
SUBJECT FIGURE 10 SHEET ___ OF ___

JOB SEA PINES PUBLIC SERVICE DISTRICT DATE 5/31/82 BY JT Moore



MAXIMUM DYE CONCENTRATION vs. TIME OF TRAVEL IN CALIBOGUE SOUND

COMPARISON OF MEASURED FIELD DATA WITH RESULTS OF NUMERICAL MODEL CALIBRATION

TABLE III. Summary of Dissolved Oxygen Distribution (mg/l)

Location	Base Condition	With Outfall
Atlantic Ocean	6.0	6.00
Baynard Cove Ent.	5.68	5.68
Haig Point	5.53	5.53
Broad Creek	5.32	5.32
Spanish Wells	5.43	5.43
Skull Creek	5.97	5.97
Bluffton	5.08	5.08

of the Sound. These values will change somewhat during a 25-hour cycle as the tide moves in and out. Since no field data were available for calibration of dissolved oxygen a conservative estimate of K and the ocean concentration was made and this primarily caused the low values of DO that are exhibited in the model. Also the high BOD at the ocean contributed to the low values of dissolved oxygen in the Sound.

Similarly it was noted that the concentration of fecal coliform did not change when the discharge was added to the natural system. This can be readily verified by considering the mixture of 8.0 cfs containing 70 MPN/100 ml with a net flow over a tidal cycle of 10,000 cfs containing a concentration of 20 MPN/100 ml.

5.0 CONCLUSIONS

The field study together with the mathematical model simulation have shown the hydrodynamic characteristics of Calibogue Sound and its tributaries. In particular the model shows for the observed tide that there is a net flow of 10,000 cubic feet per second (averaged over a diurnal tidal cycle) through Calibogue Sound into Port Royal Sound. Most importantly the study has shown that the discharge of three mgd of secondary-treated wastewater would have no effect on the dissolved oxygen or fecal coliform of Calibogue Sound and its tributaries.

REFERENCES

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3. Orlob, G. T., R. P. Schubinski, and K. D. Feigner, "Mathematical Modeling of Water Quality in Estuarial Systems," Proceedings of the National Symposium on Estuarine Pollution, pp. 646-675 (1967).

APPENDIX A

```
*****************************   CHANNEL DATA    ******************************     **************    JUNCTION DATA    *************
 CHAN.  LENGTH   WIDTH     AREA   MANNING   NET FLOW   HYD. RADIUS  JUNC. AT ENDS              JUNC.    HEAD    CHANNELS ENTERING JUNCTION

    1   2950.    3750.  106203.    0.025     9727.12       28.3        54    39                  1     3.44      52    0    0    0    0
    2   3000.    2400.   91819.    0.025     9726.09       38.3        20    55                  2     3.40      19   30    0    0    0
    3   2850.    1900.   82100.    0.025     9725.45       43.2         3    56                  3     3.44      58    3    0    0    0
    4   2400.    1550.   39403.    0.025    10183.23       25.4         4     5                  4     3.44      59    4   31    0    0
    5   2300.    1400.   45384.    0.025    10183.23       32.4         5     6                  5     3.44       4    5    0    0    0
    6   1200.    1600.   42271.    0.025    10183.19       26.4         6     7                  6     3.44       5    6    0    0    0
    7   1300.    1850.   52580.    0.025    10182.99       28.4         7     8                  7     3.44       6    7    0    0    0
    8   1300.    1550.   50247.    0.025     6117.29       32.4         8     9                  8     3.44       7    8   22    0    0
    9   1200.     850.   29239.    0.025     6117.30       34.4         9    10                  9     3.44       8    9    0    0    0
   10   1300.     450.   14565.    0.025     6117.27       32.4        10    11                 10     3.44       9   10    0    0    0
   11   1200.     450.   14113.    0.025     6117.27       31.4        11    12                 11     3.43      10   11    0    0    0
   12   1300.     550.   16705.    0.025     6117.20       30.4        12    13                 12     3.43      11   12    0    0    0
   13   1200.     650.   24295.    0.025     6117.19       37.4        13    14                 13     3.43      12   13    0    0    0
   14   1300.     650.   21045.    0.025     6117.16       32.4        14    15                 14     3.43      13   14    0    0    0
   15   2700.     750.   17535.    0.025     6117.20       23.4        15    16                 15     3.43      14   15    0    0    0
   16   3800.     700.   17060.    0.025     6117.09       24.4        16    17                 16     3.42      15   16    0    0    0
   17   3400.     900.   21038.    0.025     6117.05       23.4        17    18                 17     3.41      16   17    0    0    0
   18   5400.     800.   13095.    0.025     2834.10       16.4        18    19                 18     3.41      17   18   20    0    0
   19   1300.     700.   22650.    0.025    -6116.84       32.4         2    19                 19     3.41      18   19   21    0    0
   20   2700.     850.   16465.    0.025     3283.43       19.4        18    21                 20     3.44      57    2    0    0    0
   21   3800.     700.   14952.    0.025    -3283.40       21.4        19    21                 21     3.41      20   21    0    0    0
   22   1200.    1550.   59542.    0.025     4067.35       38.4         8    22                 22     3.44      22   23    0    0    0
   23   2400.    1050.   29828.    0.025     4067.32       28.4        22    23                 23     3.44      23   24    0    0    0
   24   3500.    1000.   20405.    0.025     4067.25       20.4        23    24                 24     3.44      24   25    0    0    0
   25   3400.     700.   15673.    0.025     4067.19       22.4        24    25                 25     3.43      25   26    0    0    0
   26   3300.     500.   10184.    0.025     4067.17       20.4        25    26                 26     3.42      26   27    0    0    0
   27   4000.     650.   13892.    0.025     4067.12       21.4        26    27                 27     3.42      27   28    0    0    0
   28   2200.     750.   12281.    0.025     4067.08       16.4        27    28                 28     3.41      28   29    0    0    0
   29   4500.     650.   18386.    0.025     4067.05       28.3        28    29                 29     3.41      29   30    0    0    0
   30   3000.     450.   10952.    0.025    -4067.00       24.3         2    29                 30     3.45      63    0    0    0    0
   31   6200.    1900.   55910.    0.025     -459.73       29.4         4    31                 31     3.44      31   32    0    0    0
   32   6000.    1900.   52112.    0.025     -459.90       27.4        31    32                 32     3.44      32   33   34    0    0
   33  14359.     517.    6923.    0.025     -461.56       13.4        32    33                 33     3.45      33   44    0    0    0
   34   8459.    1718.   40247.    0.025        1.17       23.4        32    34                 34     3.45      34   35   36    0    0
   35   5022.    1312.   30729.    0.025     -116.58       23.4        34    35                 35     3.45      35   37   38    0    0
   36   4230.    1057.   24750.    0.025      117.81       23.4        34    36                 36     3.45      36   37    0    0    0
   37   6080.    1057.   22636.    0.025     -117.67       21.4        35    36                 37     3.45      38   39    0    0    0
   38   7000.    1057.   19467.    0.025        0.74       18.4        35    37                 38     3.45      39    0    0    0    0
   39  21941.    1057.   14185.    0.025        0.41       13.4        37    38                 39     3.44       1   56    0    0    0
   40   3000.    4657.  192494.    0.025    10194.49       41.3        51    49                 40     3.44      54   41    0    0    0
   41   2846.    5950.  257970.    0.025    10193.83       43.4        40    52                 41     3.44      55   42   48   51    0
   42   5174.    4269.   99629.    0.025      462.66       23.3        41    42                 42     3.44      42   43    0    0    0
   43   3234.    1940.   55149.    0.025      462.43       28.4        42    43                 43     3.44      43   44   45    0    0
   44   9000.     647.   11903.    0.025     -461.78       18.4        43    33                 44     3.45      45   46    0    0    0
   45   7503.    1552.   28594.    0.025        0.75       18.4        43    44                 45     3.45      46   47    0    0    0
   46   7632.    1294.   23836.    0.025        0.56       18.4        44    45                 46     3.45      47    0    0    0    0
   47  13712.     906.   16680.    0.025        0.18       18.4        45    46                 47     3.44      48   49    0    0    0
   48   6468.    3622.   59420.    0.025        1.23       16.4        41    47                 48     3.45      60   50    0    0    0
   49   6080.    1035.   23198.    0.025        0.94       22.4        47    57                 49     3.44      40   53    0    0    0
   50   5419.    1050.   14088.    0.025        0.73       13.4        58    48                 50     3.44      52   53    0    0    0
   51   2264.    7114.  180507.    0.025     9728.15       25.4        53    41                 51     3.44      40   54    0    0    0
   52   3000.    4657.  192495.    0.025    10187.08       41.3         1    50                 52     3.44      41   55    0    0    0
   53   3000.    4657.  192493.    0.025   -10186.85       41.3        50    49                 53     3.44      51   56    0    0    0
   54   3000.    4657.  192497.    0.025   -10194.21       41.3        51    40                 54     3.44       1   57    0    0    0
   55   2846.    5950.  257976.    0.025   -10193.51       43.4        52    41                 55     3.44       2   58    0    0    0
   56   2264.    5950.  176507.    0.025    -9727.56       29.7        53    39                 56     3.44       3   59    0    0    0
   57   2950.    3750.  106209.    0.025    -9726.72       28.3        54    20                 57     3.45      49   60    0    0    0
   58   3000.    2400.   91821.    0.025    -9725.64       38.3        55     3                 58     3.45      50   61    0    0    0
   59   2850.    1900.   82099.    0.025    -9725.43       43.2        56     4                 59     3.45      61   62    0    0    0
```

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                                                                                                60    3.45    62  63    0    0    0
60   6080.   1035.   23199.   0.025        -0.83      22.4      48   57
61   5419.   1050.   14090.   0.025         0.63      13.4      58   59
62   5419.   2114.   28401.   0.025         0.57      13.4      59   60
63   5419.   2114.   28401.   0.025        -0.22      13.4      30   60
```

DATE: July 1, 1982

SUBJECT: Hilton Head 201 EIS/W.Q. Assessment

FROM: Chief, Facilities Performance Branch

TO: Robert Cooper, Project Officer
NEPA Compliance Section

I have reviewed the subject report and find it an acceptable basis to reinforce our earlier recommendation that a sound outfall is environmentally acceptable. However the effluent assumptions regarding dissolved oxygen and fecal coliform of 5 mg/l and 70/100 ml do not appear to have any basis. SCDHEC should be consulted regarding these. Secondary treatment does not contain a dissolved oxygen requirement. Also, the flow considered is 3 MGD. Yet this was changed to 8 cts. The inconsistency should be clarified.

Marlar

John T. Marlar

EPA Form 1320-6 (Rev. 3-76)

APPENDIX C. AUGUST 3, 1982 LETTER AND SEPTEMBER 1, 1982 RESPONSE REGARDING WASTEWATER REUSE

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AUG 3 1982

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4PM-EA

Mr. R. Arnold Ellison, Jr.
Manager, Sea Pines Public Service District
P.O. Box 5148
Hilton Head Island, South Carolina 29928

Re: Hilton Head Draft EIS

Dear Mr. Ellison:

EPA is now in the process of evaluating all the comments which were received on the Draft EIS so that the final alternative selection can be made. In the public hearing held on the Draft EIS you proposed a very interesting alternative. EPA is also interested in maximizing the reuse of wastewater as well as protecting shellfish waters. Therefore, we believe that your alternative deserves a more thorough analysis before our final decision is made.

EPA has several concerns regarding wastewater management on Hilton Head Island. In order to fully consider your alternative, I am requesting that you address how your proposal resolves these concerns. First, how and when does this alternative remove wastewater discharges from Lawton Canal which cause the need for a shellfish harvesting buffer zone. Second, what kind of back-up system is proposed during periods of high rainfall or equipment failure? Third, why is it necessary to service the existing septic tank areas since DHEC's analysis indicates septic tanks are not causing the non-point source pollution problems and very few documented failures of these systems have been noted. Fourth, how does this alternative avoid promoting high density growth and the resultant additional closures of shellfish areas due to non-point source pollution? Finally, why do you believe that a recycle and reuse system can be implemented in a cost effective and publicly acceptable manner?

RCooper/EIS/07-14-82/WE 0300X
bcc: Randy Grubbs
EC Lamar
OPM Reading File
PA's Reading File

To properly evaluate this new alternative which you have proposed we request that you provide us with the following specific additional information.

1. Your proposal involves the expansion of the treatment plant to 5.0 mgd. Please list the average monthly flows which you project for this "ultimate build-out" capacity.

2. When is the expansion of the treatment plant to 5 mgd expected to be completed?

3. How does the PSD project to utilize the 1.75 MGD in increased capacity at the treatment plant (i.e., how much for existing homes on septic systems, how much for individual vacant lots in existing developments, and how much for new developments?)? When does the PSD plan to initiate the removal of existing septic systems from service and why?

4. Please list the monthly flows which are currently being applied to the two golf courses now in use. Indicate monthly commitments which you have received from the other courses which will be receiving effluent.

5. Please list the projected monthly loading rates for the wetlands discharge area. What assumptions went into projecting these rates?

6. By month, what acreage of road medians, open space and lawns will be required to dispose of the remainder of the treated wastewater? Indicate on a map generally where you expect these areas to be located. What percentage of the road medians and open spaces are now being irrigated?

7. What are the drainage patterns of the proposed disposal areas? How would your plan avoid direct runoff of irrigated wastewater reaching surface waters (e.g., irrigation waters hitting paved surfaces; direct runoff into storm drainage systems, etc.)?

8. Generally describe the costs which will be associated with the installation of this system. Costs should include distribution to individual lots.

9. How will cross connections be avoided when the lawn irrigation system is set up?

10. What impacts are anticipated from the potential human contact with irrigated wastewater?

11. Describe what plans the PSD has for a back-up system during periods of heavy rain or malfunction.

12. How much flow in addition to the current 1.8 mgd is the PSD asking to discharge into Lawton Canal? For how long? How much additional acreage of shellfish area will have to be closed for buffer?

13. How does your plan deal with the improvement of existing non-point source problems in the PSD area as well as future non-point source problems caused by increased growth and development?

I would like to thank you again for the effort you put into developing this new alternative. In order to expedite the completion of the EIS, please submit your responses by September 1, 1982. Thank you for your continued cooperation on this project.

Sincerely yours,

/s/ Howard D Zeller
Acting
Charles R. Jeter
Regional Administrator

cc: Roger Davis

SEA PINES PUBLIC SERVICE DISTRICT

P. O. Box 5148
Hilton Head Island, S.C. 29938
803/785-6224
41 Bow Circle
Palmetto Bay Center

September 1, 1982

Mr. Charles R. Jeter
Regional Administrator
United States Environmental
Protection Agency
345 Courtland Street
Atlanta, GA 30365

Re: Hilton Head Draft EIS
Our file 8-07

Dear Charles:

This is in response to your letter of August 3, 1982 requesting additional information on our alternative for wastewater reuse. As stated in our presentation on June 23, 1982 at the public hearing on the Draft EIS, there are a number of questions we have that will take additional study and design before all the answers are available. We are happy to provide what answers we can that should be adequate for you to have confidence that our planned program will work.

For convenience we have listed the questions with our answers in the order they appear in the letter. From page 1:

1. How and when does this alternative remove wastewater discharges from Lawton Canal which cause the need for a shellfish harvesting buffer zone?

The projected ultimate maximum daily flow to the plant is:

Sea Pines	2,358,082 GPD	
Forest Beach	1,741,336 GPD	
Total	4,099,418 GPD	say 4.1 MGD

The ultimate flow for Sea Pines does not include areas currently served by septic tanks. If all lots served by septic tanks were added, the total peak daily flow would increase by 355,510 GPD for a total of 4.5 MGD. It should be noted that the plant flows fluctuate greatly with the seasons. Metered flows for the period March through September are double those October through February. This is graphically shown in Exhibit A.

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In taking a conservative approach we estimate peak ultimate flows during March through September to be 4.1 MGD and 3.1 MGD the remainder of the year.

Experience has shown that individual golf courses use up to 600,000 GPD during the hot summer months, but this cannot be guaranteed for each day. Again, using conservative estimates, the flows may be reused as follows:

	Summer	Winter
5 Golf Courses	2.0 MGD	1.0 MGD
Wetlands & Forest Preserve	1.5 MGD	1.5 MGD
Landscaped Irrigation	0.8 MGD	0.6 MGD
Total Reuse	4.3 MGD	3.1 MGD

Construction projects for the golf course irrigation and a portion of the wetlands irrigation will be completed by December, 1982. The wetlands program is limited to 600,000 GPD the first year, 1.0 MGD the second year and 1.5 MGD the third year. If this program goes as planned, we could achieve a zero discharge within three or four years.

2. What kind of backup system is proposed during periods of high rainfall or equipment failure?

During periods of high rainfall discharge to the wetlands and landscape irrigation would continue. Golf course irrigation would be cut back or stopped. If tests prove that the wetlands can handle the planned 30,000 gallons per day per acre (1.5 MGD for 50 acres) then it would be safe to plan for an additional 50 acres of wetland to also handle up to 1.5 MGD for a total of 3.0 MGD.

Another approach is to consider spray irrigation on half the 600 acre Forest Preserve at a rate of two inches per week, allowing a disposal of 2.3 MGD. With careful study and planning, we believe it will be possible to discharge up to 2.5 to 3.0 MGD in the Forest Preserve.

Most of the land in North Forest Beach and Shipyard Plantation originally drained through the Forest Preserve before Pope Avenue was constructed. Land developments around the Preserve have diverted storm drainage away from the Preserve. Thus, there has been a considerable reduction in the natural inflow to the Preserve leaving capacity for additional inflow.

It is unlikely that equipment failure would hinder the operation of the treatment facility given the redundancy when the present plant expansion is completed (see Exhibit B). During periods of extreme rainfall treated (tertiary)effluent could be discharged into Lawton Canal. Since the proposed treatment level is 5 mg/l for B.O.D. and suspended solids, the effluent will be higher quality than storm drainage from the land.

3. Why is it necessary to service the existing septic tank areas since DHEC's analysis indicates septic tanks are not causing the non-point source pollution problems and very few documented failures of these systems have been noted?

We do not believe it is necessary to eliminate all the septic tanks in the service area. However, we have sized the treatment plant to handle these areas should we need to serve them in the future. As indicated in the answer to question 1, the septic tank areas require a treatment capacity of 355,510 GPD. By not including these areas the peak flow to the plant in the summer will not exceed 4.1 MGD.

The District's policy has been not to force sewers on the property owners using septic tanks. We do respond to petitions from property owners asking for sewer service for subdivisions or to the health department when they determine an area no longer suitable for septic tanks. In either event the property owners have to pay the capital costs for extending sewers into the area. This cost usually runs approximately $3,000 per lot.

4. How does this alternative avoid promoting high density growth and the resultant additional closures of shellfish areas due to non-point source pollution?

The fact is that while the EIS was being prepared, Sea Pines and Forest Beach were being developed out according to master plans that were adopted in the 1960's. Exhibit E is a master map of the Sea Pines District showing the current stage of development. We were unable to get a similar map for the Forest Beach District in the time allowed for this reply. However, after checking with the Manager of the Forest Beach District and from our own knowledge of the District, there are only two or three small uncommitted tracts available for development. The sewage collection system in both districts will be loaded to their limits when the ultimate flow of 4.1 MGD is reached. Massive changes in the collection systems would be required to increase flows beyond their present planned limits. Recent moves in Beaufort County and on Hilton Head to minimize land use densities would also help prevent "up-zoning" of property now developed.

5. Why do you believe that a recycle and reuse system can be implemented in a cost effective and publicly acceptable manner?

The pipe system used to transport effluent to the five golf courses in Sea Pines and Shipyard Plantations pass near projects requiring high volumes of irrigation water. This pipe system would be modified as needed and extended to provide irrigation water to high use areas. If the pumping from the Ocala is not reduced, then the District will be faced with paying its share of the cost to pipe water from off-Island sites. This option will be far more expensive than expanding an existing reclaimed water system within the District.

Reclaimed water has been used in Sea Pines and Shipyard for four years, with great public acceptance. A more extensive system has been in use in St. Petersburg, Florida, for seven years with complete public acceptance. Reclaimed wastewater has been in use in California since the early 1900's with complete public acceptance. An extensive four year regional study on health effects of water reuse in Whittier, Los Angeles County, California was completed in July, 1982. (I believe the study was partly funded by the EPA.) After four years of study, no health effects could be found at all from the use of reclaimed water. Most, if not all residents of the Public Service District are aware of the Ocala's declining capacity and would welcome the opportunity to use reclaimed water in order to conserve potable water. This was evidenced at the public hearing by comments made by the Sea Pines Association of Property Owners and by the Island Commission in support of our plan. We have also had individuals request to connect to the new system serving the golf courses.

In response to your questions on pages 2 and 3 the following information is provided:

1. The average monthly flows expected at ultimate buildout would be:

Month	Avg Daily Flow	Month	Avg Daily Flow
Jan	1.6 MGD	Jul	4.0 MGD
Feb	1.6 MGD	Aug	3.3 MGD
Mar	1.8 MGD	Sep	2.7 MGD
Apr	3.6 MGD	Oct	2.1 MGD
May	3.4 MGD	Nov	1.7 MGD
Jun	4.1 MGD	Dec	1.6 MGD

These average daily flows do not include wastewater from the septic tank areas. It should be noted that the District has had to plan the treatment plant for a peak daily flow assuming a near 100% occupancy. Such a peak day will occur in August, but not for each day of the month. The reason August is not the peak month is because the occupancy rate on the Island is very low the last week of August due to school starting. The average daily flows for the winter months are also projected at less than 50% of the summer flows. There may be individual days during the holidays that exceed this average but the occupancy in general during these months is very low. These projections are made with the assumption that occupancy rates will remain the same for the future.

2. The major components of the 5.0 MGD treatment plant are currently under construction and will be completed in December, 1982. The only components that are not adequate for 5.0 MGD are the sludge digester, the tertiary filters and the disinfection system. Commitments to provide service have been limited to 3.25 MGD because of the inability to dispose of the excess treated effluent. These additional components would be constructed according to a time schedule established

by DHEC under the "Consent Order." The timing will be based on design, permit approval, construction and funding. Some of the components may be phased with the demand. Everything should be completed within three to five years depending on the results of the wetlands monitoring program.

3. As discussed in previous answers, the actual increase over the present commitment of 3.25 MGD is only 850,000 GPD for a total of 4.1 MGD. The septic tank areas will use an additional 355,510 GPD if required. New development needs are approximately 550,000 GPD and capacity for vacant lots in existing developments is approximately 300,000 GPD.

4. The flow to the existing two golf courses are presented for July, 1981 through July, 1982.

Month	Total Gal/Month Million Gallons	Avg Daily Flow MGD
July	35.3	1.139
Aug	missing	--
Sept	missing	--
Oct	20.6	0.665
Nov	19.9	0.663
Dec	19.9	0.642
Jan	16.9	0.545
Feb	14.6	0.521
Mar	14.1	0.455
Apr	5.1	0.170
May	8.4	0.271
June	9.5	0.317
July	25.1	0.810

The low flows during April - June, 1982 were caused by construction at the treatment plant. The golf courses had to use well water as a back-up that was not metered.

Formal agreements have been executed with the Sea Pines Plantation Company, owner of the four golf courses in Sea Pines Plantation and with the Hilton Head Company, owner of the 27 hole golf course in Shipyard for spraying treated effluent on the respective golf courses. Each agreement commits to using treated effluent for their total irrigation needs. The Sea Pines Company is obligated to receive at least 1.075 MGD for disposal on the golf courses or in the Forest Preserve, and the Hilton Head Company is obligated to accept at least 375,000 GPD. These commitments combined with the 1.8 MGD discharge to Lawton Canal accounts for the permitted 3.25 MGD plant.

5. The projected monthly loading rates were identified by Wilbur Smith and Associates in their report dated April, 1981. The initial three years of operation were approved by DHEC using a constant daily loading rate for each year. A monitoring program will be

conducted to determine the effect, if any, for the three different loading rates. They are:

1983	1,600,000 GPD	18.250 Million Gal/month
1984	1,000,000 GPD	30.417 Million Gal/month
1985	1,500,000 GPD	45.625 Million Gal/month

The assumptions are based on soils tests, rainfall, evaporation, and nutrient uptake by plant material. This report was reviewed and approved by DHEC and by the South Carolina Coastal Council.

6. Time does not allow us to provide acreage of road medians, open space and lawns available for spray irrigation by your requested response date. We have, however, completed a study of potable water use for Sea Pines and the entire Island. Copies of the tables related to Sea Pines and Forest Beach are attached as Exhibit C. We have found that landscape irrigation for both Districts accounts for an average of 668,000 GPD during the winter and 810,000 GPD during the summer. Single-family houses in Sea Pines use an average of 600 to 800 GPD during nine months of the year with 25% of the customers using an average of 2,378 GPD during the summer. The major portion of this water is used for landscape irrigation.

Our goal would be to stop using potable water for landscape irrigation and use, in its place, reclaimed water. We are not suggesting that rates of application be changed by the existing water users. Therefore, it may be somewhat meaningless to estimate the acreage of lawns, etc., to be irrigated. From a preliminary review we believe that we can reduce the use of potable water from our groundwater supply by 2 MGD. A system supplying water in normal quantities, as now experienced, to the landscape irrigation systems as well as to the golf courses would use all the water the treatment facility could supply. Such a system would save the District money in expansion to its water system that would be required unless the projected demand can be satisfied with reclaimed water.

Indicated on the enclosed map (Exhibit E) are locations of approximately 130 acres of existing irrigated land in Sea Pines and South Forest Beach that is adjacent to or close to existing golf course irrigation distribution mains. At a rate of one inch per week, this 130 acres would use 504,000 GPD. When adding other areas to this such as Shipyard, North Forest Beach, Palmetto Bay, Harbour Town, South Beach and single-family lots with irrigation systems, we feel that our estimate of 0.8 MGD for summer and 0.6 MGD for winter as stated at the beginning of this letter is conservative indeed.

7. The existing irrigation systems for landscaped areas use many small sprinkler heads. Hilton Head is generally flat sandy land. The existing and future irrigation systems could be inspected by the District and heads could be adjusted to prevent runoff. In general this is not considered to be a problem.

8. We cannot estimate the cost associated with a Sea Pines - Forest Beach reclaimed water system without more time and detailed planning. The initial cost to pick up those areas along the route of existing reclaimed water mains would be relatively low; however, we will have to include the tertiary filters and disinfection system to meet DHEC requirements.

9. A cross-connection program will have to be established. We would allow connection only to underground irrigation systems having no hose bibs. We will visit other areas such as St. Petersburg, Florida, that have similar systems to incorporate their experience into our program.

10. With the proposed level of treatment and disinfection, we would expect no adverse impact from potential human contact with irrigated wastewater. We are enclosing a paper from the EPA titled "A Water Quality Success Story - St. Petersburg, Florida" (Exhibit D). We have retained the services of Dr. Flora Mae Wellings, Director of Florida's Epidemiology Research Center of the State Department of Health to consult with us during our preliminary work. We would propose to consult with Dr. Wellings on our treatment system if we are given conceptual approval for the recycle project.

11. This question was asked on the first page of your letter (item 2). Please refer to our answer for that question.

12. If the reclaimed water system is approved, we believe that we will not exceed the presently allowed 1.8 MGD discharge to Lawton Canal and will begin reducing the discharge to zero. If the Forest Preserve is not approved as a backup for the five golf courses during extremely wet weather, we will have to discharge the golf course irrigation water to the canal. As we have pointed out, the quality of the discharge would be better than the surface runoff.

13. The plan does not address non-point problems. We explained at the public hearing that the major portions of Sea Pines and Forest Beach are developed. All studies and recommendations for controlling run off have dealt with new development.

The Public Service Districts are created by special legislation of the South Carolina General Assembly with specific responsibilities stated. Drainage is not one of the powers granted to either District. Beaufort County has this authority and has enacted new development regulations that address the non-point pollution problems.

A look at the enclosed map will show that increased growth beyond our plans discussed in this response is not possible.

We appreciate your review and considerations of our plan and hope that these answers are adequate to complete your review. As pointed out several times, there are many questions we cannot answer at this time, but we do feel that the facts presented are adequate for approval to pursue the plan. Please contact me if we can be of further assistance.

Very truly yours,

SEA PINES PUBLIC SERVICE DISTRICT

Arnold

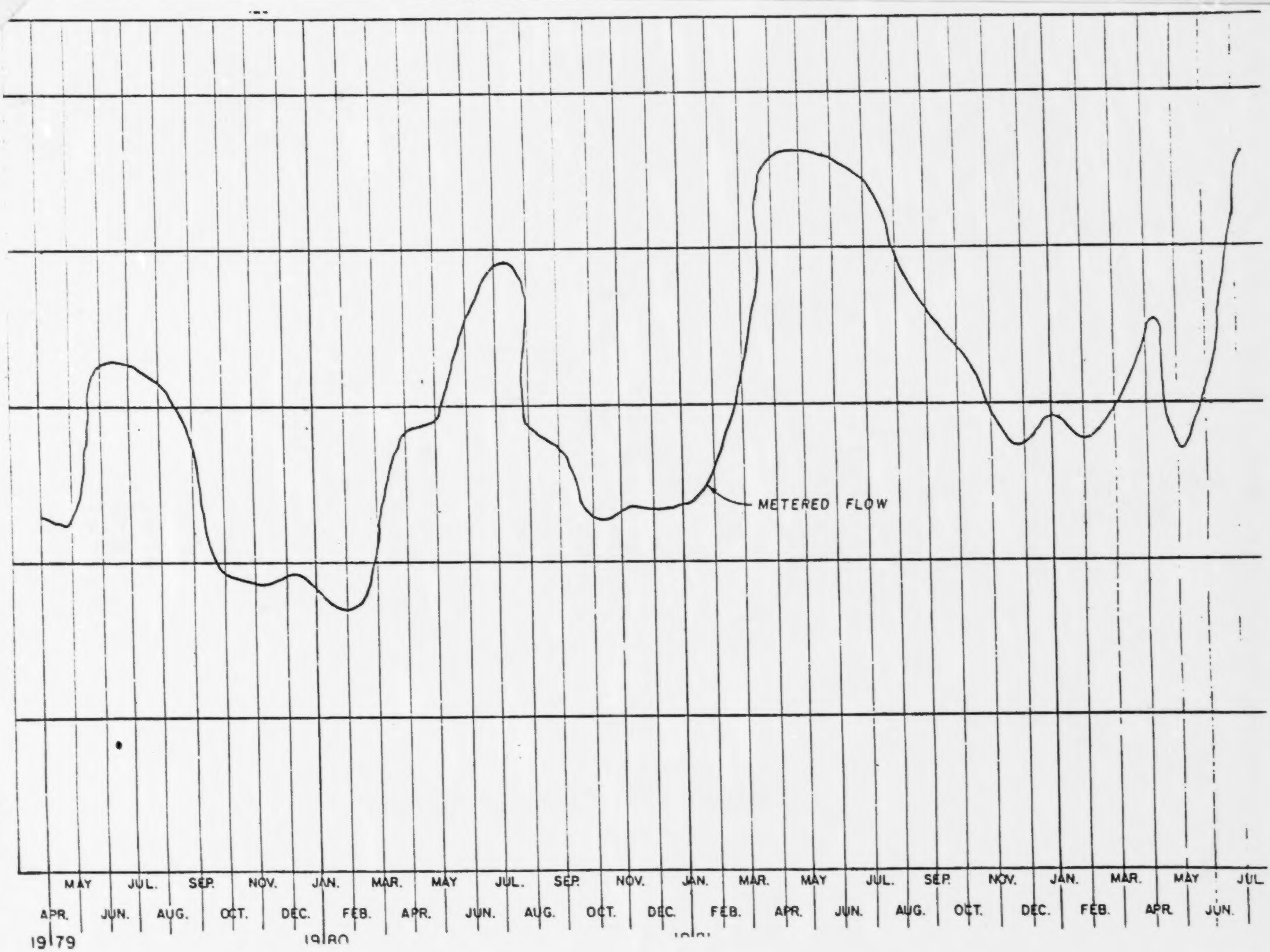
R. Arnold Ellison, Jr., P.E.
Manager

RAE/apm

enclosures

cc: Roger Davis

William Foster


METERED FLOW
APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUN. JUL.
1979
1980
1981

GENERAL PROCESS FLOW SCHEMATIC

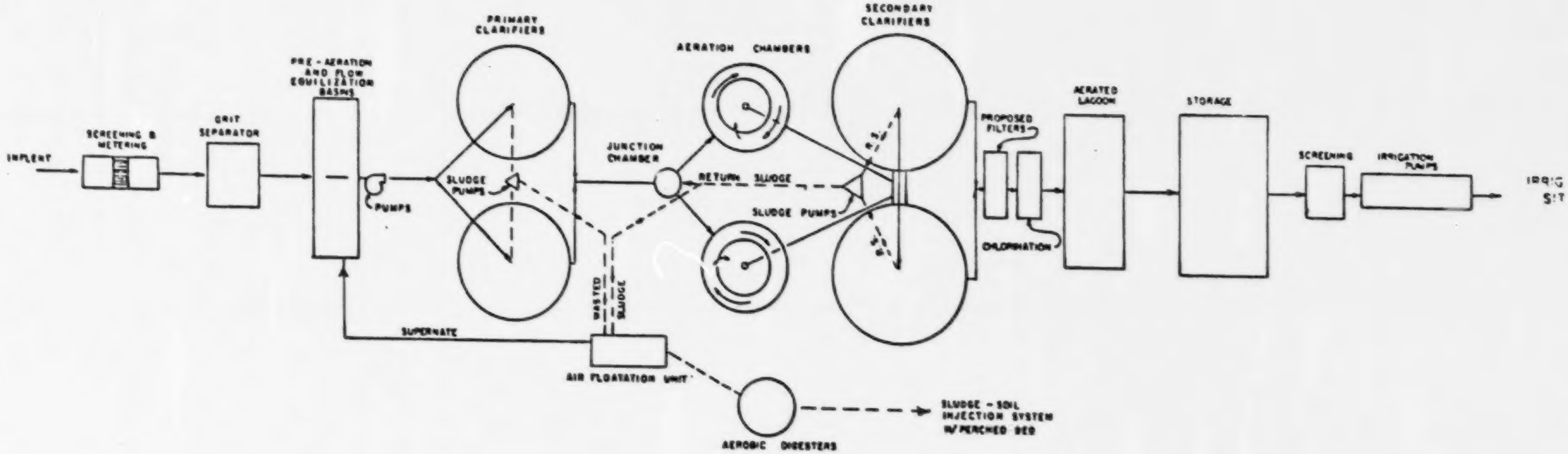

INFLENT
SCREENING & METERING
GRIT SEPARATOR
PRE-AERATION AND FLOW EQUILIZATION BASINS
PUMPS
PRIMARY CLARIFIERS
SLUDGE PUMPS
JUNCTION CHAMBER
AERATION CHAMBERS
RETURN SLUDGE
SLUDGE PUMPS
SECONDARY CLARIFIERS
PROPOSED FILTERS
CHLORINATION
AERATED LAGOON
STORAGE
SCREENING
IRRIGATION PUMPS
IRRIG
S:T
WASTED SLUDGE
SUPERNATE
AIR FLOATATION UNIT
AEROBIC DIGESTERS
SLUDGE - SOIL INJECTION SYSTEM W/PERCHED BED

TABLE B-13

HILTON HEAD ISLAND
CURRENT WATER USE FOR SEA PINES PSD

	Current No. Units	Tot. Avg. Winter MGD	Tot. Avg. Spring MGD	Tot. Avg. Summer MGD	Tot. Avg. Fall MGD	Annual Usage 10^6 Gal
Single-Family Residential	2,391	1.077	1.454	1.915	1.629	546.75
Condominium/Multi-Family	1,649	0.756	0.320	0.434	0.368	169.02
Sprinklers	118	0.322	0.362	0.576	0.540	162.02
Restaurants & Lounges	26	0.043	0.066	0.084	0.059	22.68
Retail Shops	35	0.025	0.031	0.051	0.044	13.59
Offices	34	0.030	0.030	0.053	0.052	14.85
Other Commercial	21	0.009	0.010	0.016	0.017	4.68
Total	4,274	2.262	2.273	3.129	2.709	933.59

TABLE B-14

HILTON HEAD ISLAND
CURRENT WATER USE FOR FOREST BEACH PSD

	Current No. Units	Tot. Avg. Winter MGD	Tot. Avg. Spring MGD	Tot. Avg. Summer MGD	Tot. Avg. Fall MGD	Annual Usage 10^6 Gal
Single-Family Residential	513	0.116	0.182	0.212	0.287	71.73
Condominium/Multi-Family	3,163	0.519	0.690	0.882	0.693	250.56
Sprinklers	46	0.346	0.352	0.376	0.436	135.90
Restaurants & Lounges	19	0.018	0.024	0.025	0.017	7.56
Retail Shops	35	0.006	0.005	0.007	0.006	2.16
Offices	27	0.015	0.010	0.022	0.021	6.12
Other Commercial[1]	36	0.138	0.218	0.156	0.157	60.21
Total	3,839	1.158	1.481	1.680	1.617	534.24

[1] Includes:

	Adventure Inn (66 rooms)	Hilton Head Inn (200 rooms)	Holiday Inn (200 rooms)	Sea Crest (90 rooms
Winter	279 GPD/room	263 GPD/room	220 GPD/room	174 GPD/room
Spring	550 GPD/room	360 GPD/room	321 GPD/room	332 GPD/room
Summer	545 GPD/room	456 GPD/room	361 GPD/room	445 GPD/room
Fall	300 GPD/room	422 GPD/room	222 GPD/room	310 GPD/room

TABLE B-22

HILTON HEAD ISLAND
PROJECTED WATER USAGE FOR TOTAL DEVELOPMENT
AREAS 1, 4 & 5 SEA PINES PSD

Type Customer	Total No. Units	Avg Daily Use/Unit GPD	Total Avg Daily Usage MGD	Total Qtr Usage 10^6 Gal
inter				
ngle-Family Residential	4,128	450	1.858	167.22
ondominium/Multi-Family	3,492	144	0.503	45.27
rinklers	135	2,730	0.369	33.21
staurants	35	1,470	0.198	17.82
tail Shops	50	363	0.018	1.62
ffice Buildings	60	898	0.054	4.86
her Commercial	25	--	0.011	0.99
Winter Totals	7,925		3.011	270.99
ring				
ingle-Family Residential	4,128	608	2.510	225.90
ondominium/Multi-Family	3,492	194	0.677	60.93
prinklers	135	3,064	0.414	37.26
estaurants	35	2,500	0.338	30.38
etail Shops	50	617	0.031	2.79
ffice Buildings	60	1,298	0.078	7.02
ther Commercial	25	--	0.012	1.08
Spring Totals	7,925		4.060	365.36
ummer				
ingle-Family Residential	4,128	800	3.302	297.18
ondominium/Multi-Family	3,492	263	0.918	82.62
prinklers	135	4,880	0.659	59.31
estaurants	35	2,500	0.338	30.38
etail Shops	50	490	0.025	2.25
ffice Buildings	60	1,711	0.103	9.27
ther Commercial	25	--	0.019	1.71
Summer Totals	7,925		5.364	482.72
all				
ingle-Family Residential	4,128	681	2.811	252.99
ondominium/Multi-Family	3,492	223	0.779	70.12
prinklers	135	4,580	0.618	55.62
estaurants	35	2,500	0.338	30.38
etail Shops	50	351	0.018	1.62
ffice Buildings	60	1,675	0.101	9.09
ther Commercial	25	--	0.021	1.55
Fall Totals	7,925		4.787	421.37
otal Annual Usage				1,540.44

TABLE B-23

HILTON HEAD ISLAND
PROJECTED WATER USAGE FOR TOTAL DEVELOPMENT
AREAS 2 & 3 FOREST BEACH (FOREST BEACH PSD)

Type Customer	Total No. Units	Avg Daily Use/Unit GPD	Total Avg Daily Usage MGD	Total Qtr Usage 10 Gal
Winter				
Single-Family Residential	603	197	0.119	10.71
Condominium/Multi-Family	2,958	164	0.485	43.65
Sprinklers	30	6,652	0.200	18.00
Restaurants	25	969	0.024	2.16
Retail Shops	50	142	0.007	0.63
Office Buildings	50	543	0.027	2.43
Hotel/Motel Rooms	731	235	0.172	15.48
Winter Totals	4,447		1.034	93.06
Spring				
Single-Family Residential	603	213	0.128	11.52
Condominium/Multi-Family	2,958	218	0.645	58.05
Sprinklers	30	7,660	0.230	20.70
Restaurants	25	1,279	0.032	2.88
Retail Shops	50	169	0.008	0.72
Office Buildings	50	528	0.026	2.34
Hotel/Motel Rooms	731	364	0.266	23.94
Spring Totals	4,447		1.335	120.15
Summer				
Single-Family Residential	603	371	0.224	20.16
Condominium/Multi-Family	2,958	279	0.825	74.25
Sprinklers	30	8,173	0.245	22.05
Restaurants	25	1,293	0.032	2.88
Retail Shops	50	191	0.010	0.90
Office Buildings	50	820	0.041	3.69
Hotel/Motel Rooms	731	430	0.314	28.26
Summer Totals	4,447		1.691	152.19
Fall				
Single-Family Residential	603	325	0.196	17.64
Condominium/Multi-Family	2,958	219	0.648	58.32
Sprinklers	30	9,472	0.284	25.56
Restaurants	25	909	0.023	2.07
Retail Shops	50	166	0.008	0.72
Office Buildings	50	779	0.039	3.51
Hotel/Motel Rooms	731	317	0.232	20.88
Fall Totals	4,447		1.430	128.70
Total Annual Usage				508.95

United States
Environmental Protection
Agency

Office of Water
Regulations and Standards (WH-551)
Washington, DC 20460

October, 1980

EPA

A Water Quality Success Story

St. Petersburg, Florida

"Waste treatment management plans and practices shall provide for the application of the best practicable waste treatment technology before any discharge into receiving waters, including reclaiming and recycling of water. . ."

Section 201(b) - Water Pollution
Control Act Amendments of 1972

"St. Petersburg's attitude toward environmental matters and toward regulatory agencies is remarkable and refreshing. With persistence and good humor, St. Petersburg has pursued a goal of water reuse. Innovative techniques require careful documentation and an abundance of patience. We are proud of St. Petersburg on both counts."

K.J. Starzinger, State of Florida
Department of Environmental Regulation

Once described by the Christian Science Monitor as "one of America's ten most liveable cities," the City of St. Petersburg's quality of life is unique.

Located on the southern tip of semi-tropical, scenic Pinellas County on upper Tampa Bay, St. Petersburg is cooled by the waters and breezes of Tampa Bay and the Gulf of Mexico. Nowhere in the city are you more than four miles away from open water. And nowhere else have people enjoyed St. Petersburg's Sunshine Offer -- a free newspaper on days that the sun doesn't shine on the city, an offer made good only 259 times since the publisher of the St. Petersburg Evening-Independent started it in 1910.

EXHIBIT "D"

People flock to urban areas for many reasons -- the promise of profits in a booming local economy, the lure of high-paying jobs in a dynamic industrial center -- but people came to St. Petersburg by the thousands to enjoy its waterways, its warm climate, and its recreational and retirement opportunities.

Numbering a little over 100,000 in 1950, the city grew to nearly a quarter of a million by 1977. Moreover, this city increase has been matched by Pinellas County's growth. Today it is Florida's most densely populated county.

This population explosion has had a heavy impact on upper Tampa Bay's quality of life. And one vital aspect of that quality is providing an adequate potable (drinkable) water supply.

ST. PETERSBURG IS A WATER SCARCE CITY

Much of Pinellas County's history is the story of a continual search for potable water.

Florida is blessed with the Floridan Aquifer, a thick underground layer of potable water which, unfortunately for St. Petersburg, becomes salty 500 feet under the city. A much shallower aquifer is located from ground level to a depth of 150 feet, but its water smells of sulfur and is used only for limited shallow well irrigation.

St. Petersburg's first public water supply was Mirror Lake in 1889, a water body located in the heart of the city, but population growth soon outstripped the lake's capacity to supply enough potable water and city officials looked for other sources. These early attempts to find potable water, which included drilling wells, were unsuccessful, except to prove that salt water intrusion has impacted Pinellas County's potable water.

St. Petersburg was water scarce in 1930 when the city purchased its first wellfield to the north of the city to develop the Cosme-Odessa wellfield which still supplies the city by pipeline today.

As the population grew, so did the demand for potable water. In 1962, St. Petersburg expanded its wellfield holdings by acquiring the Lutz wellfield northeast of the city, and Weeki Watchee Springs. Today, it obtains potable water from its own wells and from the wells of the West Coast Regional Water Supply Authority.

Thanks to the foresight of a long line of city officials, to ownership of its wellfields and approximately 50 miles of transmission lines, and to its working agreements with the West Coast Regional Water Supply Authority, St. Petersburg has an adequate potable water supply through the year 2000.

GEORGIA
GULF
OF
MEXICO
FLORIDA
TAMPA
ST. PETERSBURG

But time passes quickly. If the city decided to rely solely on these present arrangements, how and where would it get potable water after that?

THE CITY TAKES ACTION

Back in the early 1960's, St. Petersburg had upgraded its four waste treatment facilities in its northeast, northwest, southeast and southwest areas to secondary treatment. While these secondary facilities provided adequate treatment to their discharges into Tampa Bay, neighboring communities continued to discharge inadequately treated municipal wastes into the bay's surface waters.

Aware of EPA reports which concluded that Tampa Bay's shoreline was highly polluted, and also aware that the Florida Legislature was about to pass a strict water quality bill (the Wilson-Grizzle Act of 1972 which mandated advanced waste treatment of all municipal and industrial discharges into Tampa Bay), in 1971 the St. Petersburg City Council authorized a research and engineering study to determine the most cost effective water treatment program to conserve potable water and provide best protection for the water quality of Tampa Bay and adjacent Boca Ciega Bay.

Working with the Florida Department of Pollution Control, the U.S. Geological Survey, and the firm of CH_2M-Hill, St. Petersburg's engineering consultants, the St. Petersburg Public Utilities Department conducted a pilot study to determine the feasibility of eliminating the direct discharge of the city's treated waste effluent into Tampa Bay, and to evaluate the effectiveness of using treated wastewater for spray irrigation within an urban setting.

The study concluded that given St. Petersburg's potable water shortage, spray irrigation using treated wastewater was more feasible and considerably more cost effective than advanced waste treatment followed by discharge into Tampa Bay.

On the basis of these conclusions, St. Petersburg decided to solve its wastewater disposal problem and its chronic potable water shortage by using advanced secondary treatment and spray irrigation of the treated effluent to its green areas to save its potable water for drinking, bathing, and cooking. Once treated to safe levels, the effluent would be transported by a distribution system to spray irrigation sites such as city parks, golf courses, school playgrounds, fields and lawns. Finally, a standby deep-well injection system would be constructed to place treated effluent underground during high ground water conditions or extended periods of rainfall.

Determined to go ahead with its wastewater recycling program, St. Petersburg gave it the green light by including it in its capital investment program budget for 1972.

In a series of newspaper articles written to enlist financial support from its citizens, the city conducted a massive public education campaign to make them aware of its potable water shortage, the need to recycle treated wastewaters for irrigation to relieve this shortage, and also make them aware that the Southwest Florida Water Management District had placed restrictions on using St. Petersburg's potable water supplies for irrigation.

On October 1, 1972, Congress passed the Federal Water Pollution Control Act Amendments of 1972 which overhauled previous water quality legislation and began the most comprehensive program of water pollution control in the nation's history by mandating a sweeping federal and state effort to clean up America's waterways.

Shortly after the Act was passed, the St. Petersburg City Council and representatives of CH$_2$M-Hill approached the EPA's Regional Office IV in Atlanta, Georgia, and the Florida Deparment of Pollution Control -- known since 1975 as the Florida Department of Environmental Regulation -- in Tallahassee for implementation funds for a major water recycling program for treated effluent, complete with effluent distribution, spray irrigation and underground storage.

The City Council obtained 75 percent federal implementation funding for the project. These funds, and the money raised by the city from the sale of revenue bonds, provided the capital to expand and upgrade the city's existing waste treatment facilities to advanced secondary treatment, and to plan, design and construct pipeline distribution systems, deep-well injection systems, and spray irrigation facilities.

Since the projected irrigation sites were accessible to the public, the degree of treatment to be determined at the treatment plants was of considerable concern, for the city wanted to avoid human enterovirus-induced public health hazards from the treated effluent.

Working with Dr. Flora Mae Wellings, one of the world's leading environmental virologists and Director of the Florida Epidemiology Research Center in Tampa, and with the U.S. Geological Survey and the Florida Department of Natural Resources, St. Petersburg provided most of the money for a research effort to develop best practicable treatment to eliminate human enteroviruses -- polio, Coxsackie, and enteric cytopathic human origin (ECHO) -- all of which produce sickness in human beings ranging from stomach upsets to polio, meningitis and heart disease -- present in treated wastewaters sprayed on land.

ENTEROVIRUS REMOVAL ACTIONS

A test project conducted by Dr. Wellings and her staff showed that human enteroviruses present in secondary wastewaters seeped through Florida's sandy soil, and that enteroviruses from these wastewaters were present in ground water at depths of 10 and 20 feet after rainfall.

Working with Dr. Welling's staff, CH$_2$M-Hill's engineers determined that the safest approach from the public health standpoint was to remove enteroviruses in wastewater during treatment before spraying these waters on land surfaces.

Dr. Wellings' staff and CH$_2$M-Hill conducted a follow-up study to test various types of filter aids and filter materials. Data from this study showed that alum fed into the wastewater stream before it passes through a sand and charcoal multi-media filter system, followed by a 30-minute chlorination contact period, was the most effective method for removing enteroviruses. The effluent would then receive further, extended chlorination in covered effluent storage tanks, and additional chlorination during transport to the irrigation sites, when necessary.

As a result of these investigations, the alum-fed multi-media system -- which enhances solids-associated enterovirus removal -- was adopted for all of St. Petersburg's advanced secondary treatment plants.

FEDERAL CLEANUP ACTIONS

In a letter written on May 19, 1974, to the EPA Regional Administrator in Atlanta, the St. Petersburg Audubon Society urgently requested that EPA construction grants to upgrade and expand the city's Southwest Wastewater Treatment plant be approved as soon as possible.

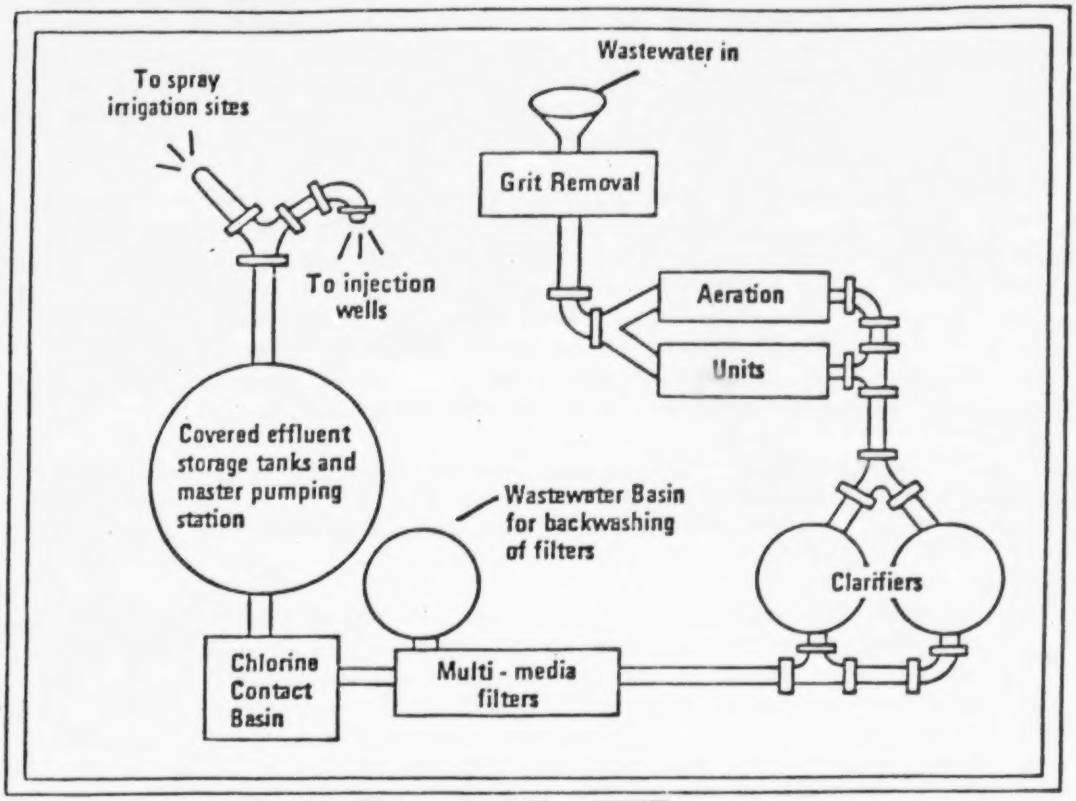
"We urge your prompt approval," the letter began, "of the grant to the City of St. Petersburg for its Southwest Wastewater Treatment Plant improvements provided under the Federal 1972 Water Act.

"This will be the first major plant in the country to accomplish zero discharge to surface waters, total wastewater reuse and recycling, and best practicable wastewater treatment. The plans for this facility are of major importance, both locally and nationally, as an example of what can be accomplished. Your approval of the grant can start our city on the way to the ultimate goal of your agency and the Congress. Further, and of great importance, is a ruling of the Southwest Florida Water Management District prohibiting the use of potable water for green areas. This, together with increasing salt water intrusion, will place the reuse of treated wastewater for irrigation as the sole dependable source for golf courses, parks, and other critical areas vital to our quality of life.

"We believe the accomplishment of the city in the research and planning that has been done merits immediate approval of these funds."

The EPA responded.

On July 14, 1974, the EPA awarded St. Petersburg $14 million to expand and upgrade its 9 million-gallon-per-day capacity Southwest Waste Treatment Plant to provide advanced secondary treatment for 20 million gallons per day of municipal discharges, and also to construct an effluent distribution system, deep-well injection systems, and spray irrigation facilities.


Wastewater in
To spray irrigation sites
Grit Removal
To injection wells
Aeration
Units
Covered effluent storage tanks and master pumping station
Wastewater Basin for backwashing of filters
Clarifiers
Chlorine Contact Basin
Multi - media filters

Flow Schematic, Southwest Wastewater Treatment Plant and Recycling System
(Courtesy, CH_2M-HILL, Engineering Consultants)

On line in 1977, the new treatment facility -- known as the Southwest Wastewater Treatment Plant and Recycling System -- consists of the following:

- An activated sludge advanced secondary treatment plant which removes 90 percent of the biochemical oxygen demand (a measure of the organic matter in water which consumes oxygen during biological processes that break it down) and suspended solids in its discharges. Treatment includes grit removal, aeration (using oxygen to break down organic wastes) and clarification (reducing the concentration of suspended matter in water).

- The advanced secondary treatment processes include alum addition, multi-media filtration of suspended solids, flash chlorination for enterovirus disinfection, and covered effluent storage tanks to meet night peak spraying demands. This system produces water which meets the present Florida numerical standards for potable water, except for nutrients which are used for urban irrigation. The chlorination and multi-media filtration system reduces enteroviruses to a non-detectable level. The effluent has a clarity of about 2.0 Jackson Units (a measure of turbidity in water); Florida's clarity requirement for drinking water is no more than 5.0 Jackson Units.

- An effluent distribution and spray irrigation system which uses all of the treated effluent except during periods of heavy rainfall. The spray irrigation system is compatible with the need for water and nutrients of the plant life being treated. Thus, nature provides final treatment to state drinking water standards through its controlled nutrient consumption, returning high quality water to the ground water table.
- A 20-million-gallon-per-day capacity deep-well injection system which places treated plant effluent underground during periods when total plant production cannot be used.

The Southwest Wastewater Treatment Plant and Recycling System is served by a master pumping station located at the storage tanks. This facility can either pump treated effluent into the Southwest recycled wastewater distribution system -- identified by brown-painted, yellow-striped hydrants and completely separate from the potable water distribution system which brings water into St. Petersburg from the north -- or to the deep-well injection system as a backup during heavy rainfall. Recycled water system components located above ground are color-coded and shaped differently than those of the city's potable water distribution system, ensuring that potable water and recycled water will not be mixed.

On June 27, 1975, the EPA awarded St. Petersburg $18.6 million to expand and upgrade its 8 million-gallon-per-day capacity Northeast Wastewater Treatment Plant to provide advanced secondary treatment for 16 million gallons per day of municipal discharges, and also construct an effluent distribution system, deep-well injection systems, and spray irrigation facilities. This facility went on line in mid-1980.

Then on September 31, 1978, the EPA awarded St. Petersburg $33.4 million to expand and upgrade its 9 million-gallon-per-day capacity Northwest Wastewater Treatment Plant to provide advanced secondary treatment for 20 million gallons per day of municipal discharges, and also construct a pumping station, force mains, an effluent distribution system, and spray irrigation facilities. This plant is expected to be operational in 1982.

Apart from differences in treatment capacity, the Northeast and Northwest facilities are identical in design to the Southwest plant.

Finally, between September 1979 and March, 1980, the EPA awarded St. Petersburg $348,220 to design a diversion sewer system, pumping stations, and structural modifications to its conventional 19-million-gallon-per-day capacity secondary Southeast Wastewater Treatment Plant, which still discharges into Tampa Bay. Projected to be constructed and operational by the mid-1980's, these ancillary facilities will divert 6.6 million gallons per day of this plant's municipal discharges to the Southwest facility, and 6.2 million gallons per day to the Northwest facility for treatment and spray irrigation. The Southeast facility's remaining 6.2 million gallons per day of treated wastewater will be distributed, as needed, to the metropolitan spray irrigation system.

RESULTS

According to St. Petersburg Public Utilities Division Director Vincent D. Patton: "By using recycled water for irrigation, St. Petersburg has reduced its peak demand upon potable water sources in areas that are presently being sewered by as much as 40 percent, effectively forestalling the day when more potable water pumping and transmission facilities will be needed.

"In addition, the cost effectiveness of this unique wastewater treatment and recycling system is shown by the fact that capital costs, operating and maintenance costs, and energy requirements are about half the cost of a conventional advanced wastewater treatment system. This is because nutrient removal, the most costly treatment cycle, is completed by nature.

"In December, 1976" Patton says, "the total capital cost of the Southwest Wastewater Treatment and Recycling System was $19 million. We've estimated that an advanced waste treatment system discharging into Tampa Bay and meeting Wilson-Grizzle Act requirements for a treated effluent containing no more than 5 milligrams per liter (mg/l) of biochemical oxygen demand, no more than 5 mg/l of suspended solids, and no more than 3 and 1 mg/l of nitrogen and phosphorus, respectively, would have cost approximately $40 million.

"Finally," Patton says, "assuming that only half of the treated wastewater is sold to commercial customers at the going rate of $1.00 per acre per month, as the rest of the effluent distribution system is completed and additional spray sites are connected, we expect a very large increase in the amount of reclaimed water use for this purpose. We intend to have this system pay for its operating costs."

There are other outstanding, long-term benefits.

"Land acquisition," says Patton, "a major capital outlay in any irrigation program, has been eliminated from the St. Petersburg system. Private and public landowners have provided green spaces at no cost and have agreed to pay the city for using treated effluent.

"St. Petersburg," Patton concludes, "has limited the use of potable water for irrigation by confining it to lawn-sprinkling on small land parcels. Today, treated wastewater distribution systems are being extended to each of the city's quadrants. In 1980, approximately 1,000 acres are under irrigation, and thousands more will be irrigated once the new distribution systems are completed. Finally, treated wastewater piped to color-coded hydrants connected to the distribution system also provides fire protection for the local citizen."

The Southwest Wastewater Treatment Plant and Recycling System has the distinction of being the first regional plant of its kind in the nation to produce an effluent in which human enteroviruses are not detectable.

"Over the years," Dr. Wellings says, "my staff has monitored the wastewater from this facility. We've found that when design criteria are met, no enteroviruses can be demonstrated in the chlorinated effluent. Even during start-up periods when malfunctions usually occur, and before effluents are discharged into the distribution lines, enteroviruses are demonstrated very rarely.

"The probability of contracting an enteroviral infection from exposure to these effluents is so remote," Dr. Wellings emphasizes, "that I consider it almost nonexistent. Actually, the chance of contracting such an infection from friends and relatives is far more likely. However, be cautious. First of all, I don't intend to drink the effluent to prove my point, but on the other hand I wouldn't be concerned if I stood near the spray field. Any contact except actually swallowing the effluent -- which could cause stomach upsets -- doesn't worry me."

Known for her wit as well as her scientific accomplishments, Dr. Wellings adds another precaution. "Murphy's Law," she says, "is still in effect: 'If anything can go wrong it will.' There must be careful and continued supervision of all aspects of this waste treatment system. If a breakdown does occur, disposal methods other than spray irrigation must be used immediately. However, provisions for these emergency alternatives are built into the St. Petersburg system."

EPILOGUE

According to Joseph Franzmathes, Director, EPA Region IV Office of Program Integration and Operations: "St. Petersburg's accomplishment is most noteworthy. For it is one of the very few cities to have gone through the full research and implementation cycle of enterovirus removal to the point that it enlisted the services of a noted virologist to ensure, once and for all, that there would be no health hazard to human beings exposed to its treated waters.

"I am equally enthusiastic about St. Petersburg's emphasis on water reclamation in a water short area, for it will certainly have a beneficial, long-range effect on any future water shortages. There's absolutely no question that in terms of civic responsibility and innovative sanitary engineering, St. Petersburg is an extremely progressive community."

In April, 1977, the Southwest plant catapulted St. Petersburg into the national limelight when the National Society of Professional Engineers selected the project as one of the ten outstanding engineering achievements of 1976.

It should be noted that this achievement received equal recognition with another example of technical virtuosity; the Viking Mars Landing Spacecraft, one of the other nine recipients honored that year.

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